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A CRITICAL SURVEY OF SOME REFERENCES TO SYPHILIS AND YAWS AMONG THE AUSTRALIAN ABORIGINES.

By CECIL J. HACKETT, M.D., M.R.C.P., D.T.M. & H.,
Adelaide.

I SHALL not attempt to deal exhaustively with the literature of syphilis and yaws for the whole of Australia; this would necessitate more time than is available. Only the better known and the more accessible statements have been taken; there is little doubt that many more would be found among the journals of explorers and early government reports. Professor J. B. Cleland's (1928) paper is of great assistance in the study of the history of disease among the aborigines, and full use has been made of it.

References to Syphilis and Venereal Disease.

Bromley (1837) states that he learned from Cooper (a European drunkard) that at Encounter Bay the sailors cohabited with and infected the natives with the venereal disease, and six of them (the original is indefinite) were coming to Adelaide for treatment.

McFarlane (1837), in a letter from Rosetta (whaling) fishery at Encounter Bay, complained of men infecting natives with venereal disease. He states that one European youth, whom after great trouble he had cured, had again consorted with the native women and became reinfected.

Wyatt (1837) made a report to the Governor on his return from Encounter Bay, where he had been to investigate the murder of a European by a native. The European, while drunk, had molested two lubras, the native husband had attacked him, and in the mêlée which ensued the offender had been killed. He writes: "This native is afflicted with the venereal disease and many other natives are known to be in the same wretched condition."

Leigh (1840), writing of his experiences as a ship's surgeon from 1836 to 1838, during which time

he visited South Australia, reports seeing a native at Adelaide, "nearly eaten away by a virulent species of syphilis, which seems to be indigenous". In an accompanying illustration, purporting to be that of an Australian native, the lower part of the subject's trunk is covered, so perhaps it was the penis that was eaten away. If this surmise is correct, the disease may have been *granuloma pudendi*. This was probably the native referred to by Wyatt (1837).

Nash (1840), Colonial Surgeon in Adelaide, in reply to a request from Captain Sturt for medicines for the treatment of natives at Encounter Bay, writes: "Although the name of the malady they are suffering from is not mentioned" (Sturt, 1840, had used the term "state of disease") "I suppose it to be syphilis and am sending Blue Pills."

It is quite possible that already two fallacies have crept in.

First, the rough seafaring population engaged in the whaling industry at Encounter Bay would most probably have contracted syphilis fairly early in life and would have become non-infective before they arrived in Australia. Many authorities believe that the chances of an untreated syphilitic infecting his partner three years after his primary infection are small, and diminish rapidly as time progresses. It is more probable that the Europeans would have infected the natives with gonorrhœa, which is notorious for its long infective period. This is still further supported by the report of a cure and reinfection.

The second doubt is whether Nash was correct in his supposition. This doubt is supported in the report of Dr. Moorhouse (1840). Moorhouse speaks of a disease of a specific venereal character which for the previous three months had raged extensively amongst the aborigines, of whom nearly one-half had been affected. It had not been introduced by the colonists, but had spread its ravages before they came. The Adelaide natives said it came from the East. He suggests that it may have come from visiting whalers.

> I can trace little connection between it and the European disease, it is greatly modified in its appearance by transmission from a white to a black race.

Basedow (1932), in quoting this passage *verbatim*, omits the word "little", which changes the original meaning.

Moorhouse, quoted by Eyre (1845), thought at first that the *glans penis* and groins were never affected, but later thought that this did occur.

Sturt (1833), in the description of his journey down the River Murray, when just east of the present South Australian border, writes (page 96):

> The most loathsome disease prevailed among them, several were disabled by leprosy, or some similar disorder, and two or three had entirely lost their sight.

On page 124, Volume II, when above the position of the present township of Waikerie, he records:

> The most loathsome of diseases prevailed through the tribes, nor were the youngest infants exempt from them. Indeed, so young were some, whose condition was truly disgusting, that I cannot but suppose they must have been born in a state of disease; but I am uncertain whether it is fatal or not in its results, though most probably it hurries many to a premature grave. How these diseases originated it is impossible to say. Certainly not from the colony, since the midland tribes alone were infected. Syphilis raged amongst them with fearful violence, many had lost their noses and all the glandular parts were considerably affected.

On page 148, Volume II, after passing the North-West Bend, he makes the following statement:

> Leprosy of the most loathsome description, the most violent cutaneous eruptions and glandular affections, absolutely raged through the whole of them.

Basedow (1932) makes no special reference to Sturt's reports.

Cleland (1928), however, raises the question of the accuracy of the use of the terms "syphilis" and "leprosy", and suggests it may have been syphilis which had spread up the River Murray, having originated from visiting whalers from Encounter Bay or Kangaroo Island. He admits there is no record of this having occurred. He thinks Sturt would have recognized it had it been smallpox, and adds: "No trace of yaws has ever been found among the natives of South Australia."

The description might very well be that of a widespread epidemic of yaws among the aborigines. The extensive skin lesions, the incidence among the children, and his statement that it was not associated with the colony support this conclusion. His use of the word "syphilis" could be disregarded. The lost noses might quite well have been "gangosa", which is valuable evidence of the presence of yaws in a native community. That "all the glandular parts were considerably affected" would quite well agree with the secondary yaws eruption, which in drier climates tends to affect the moister parts of the body, that is, round the mouth, the neck, the axillæ, the antecubital areas, the groins and gluteal cleft (Ramsay, 1925). Yaws lesions in aboriginal bones from South Australia have been recently described (Hackett, 1936).

Eyre (1845) reached Murundi (Morrundi or Moorundee, near Blanchetown, and about fifty miles below the north-west bend of the Murray) in 1841 and found the natives well developed and almost free from disease. By October, 1844, however, "from frequent intercourse with the town and neighbouring station they had contracted the most horrible diseases. From that time on many were in a dying condition, some already dead, and but a few of those who had frequent intercourse of every age and both sexes were wholly free from this disease." He describes "round pustules, commonly of the size of an ounce weight" which "rise from the skin".

> The centre of these is gradually filled with flowing pus, then as they grow larger and larger and disperse, the surface of the whole body is affected with wasting and scab, which cause horror and disgust to those near them. These ulcers sometimes may persist for six or eight months; but generally when irritants or caustics are applied locally they are cured within three weeks.
>
> After the first or second year the disease disappears, but sometimes causes death. But the unfortunate victims always suffer great torture and continuous pain.

He states that he had seen the *glans penis* and groins affected in natives on the banks of the Murray. In the same part of his book Eyre writes:

> Of the diseases from which they [the natives] suffer since the arrival of the Europeans, by far the most frequent and most deadly is the venereal stain. It can now by no means be decided whether this disease was known to the natives before the Europeans mingled with them. They themselves say that it was long before brought from the East, from which it seems very probable that it had its origin in Europe, and from hence tribe to tribe was carried throughout the whole continent.

He states that the disease was less frequent and severe among tribes which do not mingle with Europeans.

> Moreover, the habits of the natives are such that, whenever the disease appears in its worst form, it spreads with a swiftness and virulence found nowhere else.

He writes:

> These tribes well know that this disease, like other diseases of the same kind, is contracted by contact.

In Eyre's book the above descriptions are in Latin; Cleland (1928) has kindly published a full translation of them. Basedow (1932) considers this a description of *lues venera*, and adds: "Some of the lesions and conditions observed by Eyre were no doubt of the nature of a soft chancre."

It would appear that the epidemic Sturt reported had subsided by the time Eyre reached the locality ten years later; then after three years, perhaps on account of poor seasons, the general health was lowered and the disease became again evident in quiescent cases and children were infected.

The early records of rainfall for Adelaide kept by Kingston (1861) give the following values:

Average annual rainfall, 1839-45, 19·30 inches on 111 days.

1841,	17·95	93
1842,	20·32	119
1843,	17·19	105
1844,	16·88	135
1845,	18·83	124
1846,	26·88	114
1846-52,	25·27	

Earlier publications of these records include an error in the values for 1844, which was not corrected until 1861.

When Mr. E. Bromley, the Divisional Meteorologist for South Australia, was approached regarding the climate of these years, he said that the winter rains of 1843 and 1844 were good, but there was undoubtedly a dry season from September, 1843, to June, 1844. Although Murundi is seventy miles from Adelaide and lies to the east of the system of ranges which has an influence on the rainfall of Adelaide, he thought it was possible that there may have been a poor season in that district during the summer of 1843-1844. The average annual rainfall at Blanchetown is about ten inches.

That this description might well be considered that of a secondary yaws eruption is supported by the account of the duration of the disease. The "great torture and continuous pain" may refer to the bone pains of yaws.

A small percentage of primary genital lesions is reported in most extensive investigations in yaws-infected communities, and eruptions on the groins often occur in yaws. If one recalls Moorhouse's findings on this point, it may be assumed that it was not of frequent occurrence and might possibly be accounted for by a few cases of *granuloma pudendi*.

The natives say that it came from the East; and this gives Eyre no ground for concluding that it came from the Europeans. I presume he refers to the settlers in Sydney, which would mean an overland spread of nearly five hundred miles. He speaks of the intense infectiousness of the disease. This is well known in yaws, for in many communities where yaws is rife it is found that nearly all over four years of age have been infected with the disease (Lambert, 1929, for Samoa).

Penny (1841), writing from the elbow of the lower Murray, states:

> There are few individuals amongst the natives who have the disease severely, but the larger proportion are only slightly affected and are anxious for medical relief.

He asks for further supplies of copper sulphate and potassium nitrate.

A popular remedy in central Australia among the settlers for the disease *irkintja* (yaws) in the natives is copper sulphate (blue-stone) and vaseline, and apparently it hastens healing.

Hutt (1844) writes of two reports of a disease in the native camps "far beyond York" in Western Australia, where "38 cases, male and female, were found suffering from a loathsome venereal disease". A hospital had been established there six months previously (May, 1842), and in one month, of seventeen patients treated, ten were cured. He states that a similar disease was present at King George's Sound. This might well be yaws. It is improbable that it was syphilis.

Wilmot (1842), in his report to Robinson, Chief Protector, gives an account of what he calls syphilis at Nerre Nerre Warrew (Narre Warren, at the foot of the Dandenong Ranges, Victoria):

> The natives declared the disease was unknown before they had intercourse with the white people. It generally originates with a small cluster of irritable papules on the inside of the thigh or scrotum and perineum, which rapidly coalesce, and degenerate into foul ulcers, terminating ultimately in a warty excrescence; in a few weeks it spreads very widely, and the skin becomes at length affected with a scaly eruption of a circular form, with a well-defined margin, giving it much the same appearance as lepra vulgares. The action of the virus is singularly modified by the habits and constitution of the native, as it does not appear to pass through the ordinary channel of the lymphatic system into the constitution, but directly through the general circulation or capillary vessels, as only in one instance, and that of a dubious kind, did I meet with any appearance of specific glandular affection. In no case did I find any other than the inguinal glands affected, in no case was there any ulceration of the fauces, nor did I meet with a single instance of a venereal node.
>
> Although it no doubt arises from a specific virus, still the disease is much aggravated by their filthy habits.
>
> I expect in the arsenical solution to find a valuable remedial agent in the treatment of this form of disease.

In the soundness of your expressed opinion before I proceeded to the station, of the inapplicability of mercurial medicine to the circumstances of the natives I entirely accord.

Referring to the last statement, Basedow (1932) wonders "whether possibly some of the cases recorded by the early observers were yaws and not syphilis".

It is difficult to interpret Wilmot's statements; he is not quite satisfied that it is syphilis; his description, together with his remarks about treatment, applies more aptly to yaws than to any other disease, except for the scaly eruption which is a frequent manifestation of syphilis in African negroes, and for the native belief that it was not present before the Europeans came.

Tuckfield (1842) writes that the natives of Geelong (Victoria) "were entirely free from those loathsome diseases under which vast numbers of those who are associated with Europeans groan, and which have in so many instances terminated in death".

Robinson (1844), in a report of a journey to the eastern coast and interior of Victoria, when near Omeo, writes: "A loathsome disease (syphilis) among the natives, imported by the Europeans, is making ravages."

Robinson (1845) on a journey to Wimmera (Victoria) writes, when near Mount Cole: "visited natives suffering from a loathsome disease, the effect of illicit intercourse of white men with native women—one woman was in the last stage of suffering." From Lake Hindmarsh (Victoria) he reports: "Two men afflicted with venereal disease could scarcely walk, an additional proof of the baneful effects of syphilis among the Aborigines of the Interior." Near Glenelg River, South Australia, he reports: "Several natives afflicted with syphilitic disease." He writes: "A plague, the consequence of a dispute with a neighbouring tribe, who had the power, they said, of inflicting it, was apprehended."

In the medical officer's report for the Goulbourne River district (Victoria), which Robinson (1848) includes in his report, is found: "March 3, visited large numbers of natives at Seymour and at Cameron's Well, on the Sydney, as usual a great number were suffering from syphilis." In Appendix B, by John Walton, surgeon, of Robinson's report (1848) it is said that at Mount Rouse "syphilis less frequent than formerly".

Tuckfield's and Robinson's statements are all probably influenced by the opinion of Wilmot (1842), so the literal diagnosis cannot necessarily be accepted. The statement that two men with the "venereal disease could scarcely walk" may perhaps be correlated with the grossly pathological bones which have been found in Victoria. All indications point to these bony changes being the result of yaws. That one tribe should have had the power of inflicting a "plague" on offenders is similar to the Aranda people's "power" of disseminating *irkintja*, which is their name for yaws (see below).

Hull (1858) says that syphilis existed among the aborigines before the Europeans came to Australia. Earlier he had said the disease the natives suffered from was like syphilis, but indigenous. He refers to Wilmot's statements.

If Hull is correct that the disease was present when the Europeans arrived, it is almost certain, from the findings in the Northern Territory, that it was not syphilis.

Beveridge (1889), writing of the aborigines of Victoria and the Riverina between 1845 and 1868, states that venereal disease "long before the advent of the white man, was one of the greatest scourges this primitive people had to bear". He suggests that the Malay and Chinese trepang hunters brought it to "the northern coast centuries ago, from whence it spread from one tribe to another, until the disease became a national calamity". Later he states that there was an absence of "contagious" disease, except "occasional visits from influenza, which often has a fatal termination".

During winter they, 'tis true, are very much subject to a kind of scurvy, which, from its prevalence, might be deemed contagious, but we are inclined to imagine that it partakes more of a venereal character, and each breakout is due to lack of nutritious food, combined with cold, wet lodgings. As the mild spring advances, and food becomes plentiful, this distemper gradually leaves them, and by summer their skins have returned to their normal sleekness, with a glossiness truly wonderful, considering the blotches with which they were marred during winter.

What has been said of Hull's statements applies also to those of Beveridge. As yaws is prevalent in Malaya, it is more probable that they would have carried that disease to Australia rather than syphilis. It is not certain whether syphilis existed in China prior to European contact. His description of a "contagious venereal scurvy" is rather indefinite, but there are sufficient grounds for considering that the diagnosis of yaws would more probably be correct. Despite what he says of the effects of climate, the winter would be the best season for food; the chief influence of the cold season would be the wearing of body covering and closer contacts to maintain warmth.

Barrington (1802), in his "History of New South Wales", writes:

The venereal disease, there is every reason to imagine they were not ignorant of before they knew us, but if they were, our arrival will account for its appearance shortly after, though every care on the part of the Governor was taken to prevent it.

Here is another opinion that the disease was present before European settlement. The diagnosis cannot be taken as definite.

Handt (1842), reporting on the conditions of the natives in the Province of Moreton Bay (Queensland), writes:

The sicknesses they are subject to are chiefly consumption and rheumatism; and many of them, children not excepted, are infected with the venereal disease.

As the climate of this area is definitely tropical, and children were also affected, this condition is also probably yaws.

As an indication of the accuracy of medical diagnoses in the early days by laymen and others,

reference might be made to the reports of smallpox in South Australia in the early forties. A report was found in the archives at Adelaide which has been missed by reviewers.

Moorhouse (1845) refers to the itch (*scabies papuliformis*) as universally affecting the natives. It had made its appearance nine months previously and had spread over a range of four hundred miles. On account of the great tendency to pustule formation, it "was formerly mistaken for smallpox but yields readily to treatment with sulphur ointment". Moorhouse (1848), referring to native school children in Adelaide, states that when a child lived with its parents for a few days the itch was sure to show itself. Yet at this time smallpox was reported from a large area east and west of Adelaide.

Tate (1881) records that Dr. Gething, who was at Streaky Bay in 1866, told him that "he treated the disease as smallpox, to which it had a close similitude, presenting similar symptoms". The natives at Streaky Bay declared that it came from the north.

Confusion of nomenclature of disease continued through the literature, as is shown in Foelsche's (1881) paper, dealing with the native tribes east of Darwin.

> Syphilis is occasionally met with, but it is by no means common among the natives. I have seen only a few cases during the eleven years I have been there.

Again:

> Venereal disease is rather prevalent and they have some means of curing it.

Later he confuses arteries with veins when speaking of blood-letting for ceremonial purposes.

Woods (1879) quotes the following as a footnote from Eyre (1845) (ii, 239):

> To this must be added, from time to time when the Europeans mingled with them, venereal stain. Mothers communicate the disease to the infants, and a great number perish every year from that cause.

He continues (translation from Cleland, 1928):

> In this it is probable that Eyre has been to some extent mistaken. The effect of the ailment to which he refers, according to statements gathered from a variety of quarters, was never so widely disseminated as his note would indicate. It is of course impossible to assert that it has not had some influence over the Aborigines, but proof is wanting that it has been sufficiently wide-spread to justify its being regarded as one of the primary causes of the dying out of the tribes. It is not known whence it was derived, or whether it existed among the tribes before the advent of the Europeans. He states, however, as a fact that in 1841, when they assembled at Moorundi, there was but little sickness amongst them, but after visiting the town and adjacent stations, they appeared to have contracted some horrible disorders. He describes certain appearances which are known to be produced from other causes. It is remarkable that if the case was as represented by Eyre, the Narrinyeri tribe must have been particularly exposed to its influence, and it must have left its traces amongst them. Mr. Taplin, however, makes no mention of it, and he would scarcely be likely to pass over such a circumstance if it existed. The natives of some tribes suffer from a sort of leprous or scrofulous disease, which exhibits many of the characteristics mentioned by Eyre, but this disorder seems to afflict individuals and not families.

He refers to Gason's description given below. "One complaint may thus have been, and not improbably was, mistaken for the other. A friend of mine" (F. Marchant, of Arkaba, in the Flinders Ranges, South Australia) "first called the attention of the writer to the existence of this malady. At the same time he mentioned what would seem a certain cure for it." He describes how a native at Canowie, "in a deplorable condition of suffering from this disease", was "dipped like a sheep". "The dipping mixture (for scab) was composed of water, soft soap, tobacco and arsenic—the last in the proportion of one ounce to the gallon of water." After becoming much worse, "he lost his hair and his finger- and toe-nails", and then "his skin came off", but "eventually he got quite well". He says that "other blacks who had heard of the circumstance came to Canowie and begged to be dipped", but no one had the courage to repeat the experiment lest " a trial for murder or manslaughter" ensue.

That Woods should question the accuracy of some of Eyre's statements is interesting. I have been told that many of the early shepherds on Flinders Range sheep stations were there for the benefit of the more settled areas, so it is more than likely that the native was as thoroughly immersed in the dip as were the sheep. The general shedding of the epidermal structures was probably the result of direct action, but it is possible that some of the mixture was swallowed. Probably his recovery was hastened by the arsenic. One is inclined to regard this disease as yaws.

Gason (1879) writes, page 283:

> Mirra.—A disease which every native has once in his life, sometimes at three years of life, but more frequently at fourteen, or thereabouts. The symptoms are large blind boils, under the arms, in the groins, on the breasts or thighs, varying in size from a hen's egg to that of an emu's egg. It endures for months, and in some instances for years, before finally eradicated. During its presence the patient is generally so enfeebled as to be unable to procure food, and in fact is totally helpless. It is not contagious, and is, I surmise, peculiar to the natives, whose only remedy is the application of hot ashes to the parts affected.

Gason was a police trooper, and it is difficult to reconcile the large size of the lesions, if they were swellings, with any disease of such widespread distribution and apparent chronicity. He must have intended that it was not contracted by Europeans.

It is also difficult to picture the condition of a native population among whom at some time in life every individual was incapacitated for months or years. If, instead of "blind boils", one assumes granulomata, and tempers other parts of the description, it is possible that the disease was yaws.

Taplin (1886), referring to the Murray Lakes area, writes:

> I have seen cases, even bad ones, of syphilis amongst the natives. I am sure the disease was imported among them; they knew nothing of it before the advent of the whites—this is the testimony of the natives. I have known fatal cases, also cases where the tibia was affected, and bony excrescences on the skin, with atrocious neuralgic pain; I have also seen buboes in the groin.

Venereal disease is not very prevalent; I am persuaded that sometimes cases of impetigo have been mistaken for it.

This article was published after Woods's (1879) and cannot be regarded as an authentic statement that syphilis occurred among these natives.

Mackillop (1892-1893), referring to the Daly River tribes, stated that cases of cancer were frequent and syphilitic diseases seemed to have gained upon them. There was no word in their language for it, so he believed syphilis was of recent origin.

Cancer is very rare among the aborigines; it is quite possible that cases of gangosa or other tertiary yaws lesions were misdiagnosed cancer or syphilis.

Schultze (1890-1891), referring to the Finke River natives, states:

The worst disease among them is syphilis, with which everyone is more or less tainted. From the first we have had to treat this disease and several natives have died of it. It appears to be coming more common, due probably to general prostitution.[1]

Stirling (1896), page 127, writes:

Venereal diseases are extremely rife amongst the natives, undoubtedly largely owing to infection by the whites. In a few instances I observed the characteristically disagreeable facial aspects due to destruction of the nasal septum and falling in of the bridge of the nose resulting from syphilis. In other cases there were the usual ulcerative affection of the soft palate or loss of voice from laryngeal invasion.

It is still a moot point whether these diseases existed before the advent of Europeans. I can see no reason why the causes, whatever their precise nature, which first gave origin to them elsewhere may not have also operated here endemically.

He refers to Plate XII, Figure 13: "a naturally unprepossessing countenance—the effects of this disease are probably apparent".

Harley (1933), page 252, writes: "Chronic laryngitis is . . . a prominent symptom in hidden gangosa", and he includes ulcerated soft palate in the same category.

Stirling's statements are sufficiently loose to allow of a safer diagnosis of yaws.

Prinsep (1899), Western Australia, in his annual report writes of the "growing prevalence of venereal diseases amongst the aborigines in some places". He quotes the police report for Wyndham, Western Australia: "Syphilis is becoming very prevalent." From Hall's Creek, Western Australia (1898), natives were reported to be disabled by blindness, locomotor ataxia and syphilis.

Roth (1901) writes:

By the term venereal, as commonly employed, must be understood at least three distinct diseases, gonorrhœa, venereal sore and syphilis.

Syphilis may answer to ordinary drugs, mercurials and iodides, but unfortunately this disease takes on very often a malignant or galloping form, running a rapid destructive course. Phagedena appears to be a comparatively common complication of venereal disease.

He noticed comparatively few cases of hereditary syphilis.

I have met with two cases in private practice where European children have been accidentally infected with syphilis.

Natives as a rule do not seek European advice until they have exhausted their own remedial measures, and the disease has already got a firm hold on them.

Roth does not attempt to differentiate yaws from the "venereal" group, nor does he take into consideration *granuloma pudendi*, which might possibly account for the phagedena cases. That mercurials are not wholly satisfactory is a frequent statement concerning yaws (Goodpasture and de Leon, 1923), although United States naval workers at Guam and Haiti state that mercury will cure yaws (Butler, 1928). Of potassium iodide Fitzgerald *et alii* (1934) say that at one time it was used fairly extensively in the treatment of yaws, as in Castellani's mixture, but, as far as they could ascertain, it was entirely inactive. Roth may have confused mild gangosa with hereditary syphilis.

Smith (1906), in discussing errors of diagnosis, is careful to differentiate certain conditions from leprosy. He refers to several instances of mottling of the skin of the hands and feet which, he states, are "of a specific nature".

This is probably the result of yaws—*melung*.

He refers to "specific disease of the mouth and nose in the black fellow".

In one woman I saw that the cartilages of the nose were gone, and the skin was cicatrised in the neighbourhood, including the upper lip.

This might safely be considered as gangosa.

I saw one man with an extensive wound in the sole of the foot and part of the toe was lost, two of his fingers also were contracted. There was indistinct history of specific disease.

This also might have been due to yaws.

Eylmann (1908), page 438, writes:

Syphilis is spread all over the Colony.[1] According to my observations there are only few among the natives whom it has spared. Quite frequently it appears in very serious forms. Thus for example one can meet more frequently than among ourselves, people who are extremely disfigured by the loss of their noses, or in whom it had led to the destruction of the hard palate and a connection between the mouth and nasal cavity. Affections of the bones are not rare. Cutaneous tumour does not often occur. However I do not wish to leave unmentioned that I met a native at Tennant Creek who suffered from freely suppurating syphilitic ulcers and who asserted that he had become infected with the disease in an Eastern tribe, the majority of whose members suffered from it.

We may perhaps assume that syphilis would, in most cases, run as serious a course among the natives as it does among the Germans. This however is not the case because it has not been in the country for long. At any rate the number of serious cases would be much smaller were medical treatment so readily procurable and were it as frequently taken recourse to as among ourselves. We must likewise not forget that the native who lives in a chronic state of hunger in all probability has less power of resistance against disease than the well fed white man.

I need not stress that the number of children who suffer from hereditary syphilis is not small. As among ourselves, syphilitic women after a few years often give birth to quite healthy children. Thus for example I treated at Barrow Creek Station a lubra, twenty to thirty

[1] *Vide* Basedow (1932), *infra*.

[1] South Australia before 1911 included the Northern Territory.

years of age, whose palate and throat were covered with syphilitic ulcers which had already destroyed the uvula and pierced the hard palate. Her two small daughters (the father of the younger one was an Englishman) however were among the strongest and most healthy native children I saw.

I should not like to leave unmentioned that bushmen who had contracted syphilis from lubras seldom developed severe lesions in spite of the fact that they received no medical treatment. This contradicts the supposition that the disease usually appears in more serious forms when Europeans become infected from people belonging to an alien race. Whether the climate and the mode of living have a good influence on the course of the disease I am uncertain. Usually the bushmen of the inland do not often become infected, which may be explained by the fact that as a rule they only find opportunity for sexual intercourse with the older lubras, the greater majority of whom have contracted syphilis years before and are no longer infectious.

Where and when syphilis for the first time appeared in Australia no one, of course, can tell us. However, we seem to be compelled to assume that it was imported by Malays and Papuans a long time ago. The greatest number of syphilitic cases were at Hermannsburg Mission, in the environment of townships and on the gold-fields. Here, where almost all lubras are prostitutes, syphilis naturally occurs more often than among the tribes who still severely punish an unpermitted breach of marriage (if I may say so). The number of syphilitic persons would however be somewhat smaller near the settlements if the boys and lubras in the service of Europeans did not have many sick relations or friends. (Translation.)

The widespread distribution and the occurrence of facial destruction is more suspicious of yaws than of syphilis. This also applies to the native whom he saw at Tennant Creek, and most probably to the lubra at Barrow Creek.

In reference to the absence of severe infection among the "bushmen" (that is, Europeans), his explanation gives one the impression that infection was extremely uncommon. That the Europeans have intercourse chiefly with the older lubras is quite contrary to what one sees and hears in the interior.

That the Malays and Papuans imported syphilis into Australia is not probable, as among both these peoples yaws is prevalent. There is no proof either that syphilis occurred prior to European contact or that syphilis is or was at any time prevalent among the aborigines.

Syphilis does not exist at Hermannsburg (1934); this is more than thirty years later. Pathological conditions occur there which probably Eylmann would have considered syphilitic, but which clinically and from their rapid response to "Novarsenobenzol" are now diagnosed as yaws. Herbert (1910) states that of one hundred aboriginal females examined by the Government Medical Officer, only one was free from traces of venereal trouble. This probably refers to gonorrhœa, which at present is disturbingly frequent among the natives and half-castes in contact with settlements. Gonorrhœa was not found among the bush natives of the Central Reserve (South Australia) in 1933. Breinl (1912) gives a table (4) of statistics of the Darwin Hospital from 1897 to 1910, which deals mainly with non-aboriginal patients. Among 1,284 patients, only 24 cases of syphilis were treated, and in eight years of this period there were no cases of syphilis. Gonorrhœa was not included, and only one case of yaws is mentioned. In Table 3, of 2,335 certified deaths among the non-aboriginal population from 1871 to 1910, eleven were due to syphilis, one to gonorrhœa and three to granuloma. If syphilis were frequent among the natives, one would expect to find more evidence of it in these statistics.

Breinl refers to the case illustrated in Figure 19 as the result of syphilis, which is probably due to yaws, being a minimal case of gangosa. He reports yaws as being prevalent among the native children in some localities.

Breinl and Holmes (1915) report that yaws is "fairly prevalent amongst the children" of the Daly River tribes, so that it "may be safely assumed that practically every child suffers from the disease in a mild form at one time or another during its youth". "In later life, as a rule, only a few scarcely perceptible scars, sometimes round the mouth, or in the genital region, bear testimony to the previous illness." They saw several cases suspicious of tertiary yaws. They refer to a case similar to one seen in New Guinea, "which has been described as a 'peculiar disease characterised by arthritis, osteitis and periostitis'," in which the "upper part of the right tibia was considerably swollen and curved forwards, with fistulous openings discharging a light amber-coloured clear fluid". The left tibia and both ulnæ were affected. "The genitals appeared normal, and no history of previous attack of yaws or syphilis could be obtained."

They state that several authors consider this to be a tertiary manifestation of yaws, but they consider it a "disease *sui generis*".

The evidence of Bahr (1914), Spittel (1923) and Knott (1931) would indicate that these were cases of yaws. I saw a similar case on the south side of the Mann Range in 1933. In other cases I have known great improvement in similar, but less numerous, lesions to follow the exhibition of modern arsenicals.

"One case of advanced syphilis was seen" (Anson Bay) in a boy, aged about nineteen years, in a comatose condition. His disease was supposed to have begun from the time he was employed by white men. "He showed the typical lesions of tertiary syphilis. His outer nose had disappeared, his soft palate was perforated as the result of a large gumma and pus was exuding from his mouth." It is highly probable that this was a case of tertiary yaws with gangosa, especially as it occurred in an area where they record "yaws is fairly prevalent amongst the children" (as previously quoted).

Before reference is made to the more recent papers by Cleland (1928) and Basedow (1932), it might be emphasized that I am not interested in the occurrence of syphilis among the relics of native tribes at present existing as islands in the sea of European settlement.

Cleland (page 141), after referring to the early records which have been dealt with above, reports statements received from medical men in various localities.

Atkinson (Perth, Western Australia) states that syphilis and gonorrhœa are particularly prevalent where Asiatics mix with aboriginals, as in pearling areas.

Atkinson, in 1935, believed that yaws did not occur in Western Australia.

Junk (Wondai, Queensland) states that syphilis was at one time very prevalent at the settlement. The lesions were mostly extensive and chiefly involved the genital region in both sexes. They yielded readily to mercurial treatment, but most patients died from other contributing factors before the tertiary stage was reached.

Leighton Jones (Darwin, Northern Territory) states that he has met with congenital lesions, such as keratitis, in several cases. He has seen perforating ulcers of the palate similar to those in Europeans.

Leahy (Innisfail, North Queensland) considers that the syphilis among natives is similar to that in Europeans, but more chronic.

Illingworth (Taroom, Queensland) states that 20% of natives of the settlement were probably affected with venereal disease and that syphilis spread very rapidly. The chancre was of the same type as in Europeans. He had seen only one case of a secondary syphilitic rash, and that resembled scabies. He considered the disease less grave than in Europeans. He had never seen any case of syphilis of the nervous system. He mentioned one gumma of a cervical gland, two cases of severe heart disease, none of aneurysm, one case of rupture of the aorta from syphilitic atheroma, and six cases of gummatous vulvitis, of which two had been cured. Congenital syphilis was commonly causing the deaths of a "fair number of children up to the age of six or seven years". "These cases showed a trophic rhinitis with sunken bridge to the nose, mental backwardness and stunted growth, and were rather puny."

Vernon (Thursday Island) states that syphilis is undoubtedly common.

Basedow's cases will be dealt with under his own paper.

Cilento (Townsville) considers that syphilis is uncommon and he has never seen a primary chancre. He states that it has been suggested that this is due to the presence of yaws among the natives.

In the section of Cleland's paper dealing with insanity (page 262) there are six cases of general paralysis of the insane and two doubtful cases out of a total of 110.

Cases of general paralysis would be more numerous, both relatively and absolutely, if syphilis were common among the natives and ran a course similar to that in Europeans.

In some of the above reports the condition is probably syphilis, but in others this conclusion is open to grave suspicion.

Basedow (1932), page 194, deals first with the early literature and then adds his own experiences.

I have found syphilis most common among those tribal groups which are resident along the beaten tracks of European and Afghan travellers [the latter are camel teamsters].

According to the natives:

Neither syphilis nor gonorrhœa was known prior to the occupation of their country by Europeans. There still exist a few communities, such as the Western Aluridja and Wongapitcha, inhabiting the Mann, Tomlinson and Petermann Ranges in the Lake Amadeus region, who so far have not come into such contact with civilisation; and these, when last I visited them in 1928, were happily free from venereal diseases.

I saw cases of boomerang leg, yaws and *granuloma pudendi*, in the Mann and Musgrave Ranges in 1933.

Referring to the Lutheran Mission Station at Hermannsburg, Basedow states that in 1920, when he visited it, "venereal troubles were practically unknown locally; only two or three cases of tertiary syphilis were registered". He refers to the natives camping at Alice Springs as "positively reeking with disease at the time", leaving one to infer that the disease was syphilis; but in 1934 I saw no evidence of syphilis among them, though the same cannot be said of gonorrhœa. There is no syphilis at Hermannsburg.

Basedow continues:

Great contrasts are observed in any such districts as have been victimised by the vices of civilisation for any appreciable time. Hereditary syphilis then manifests itself in many forms in the children, most conspicuously perhaps in the form of the almost ubiquitous "snuffles" and objectionable nasal catarrh with a sero-purulent discharge.

Muco-purulent nasal discharge is common in native children and adults in central areas and in the Mann Ranges (observed in 1933). It was markedly influenced by the climatic conditions and in every way resembled a "cold in the nose". It is of interest to note that despite its frequency among the natives with whom we were in close contact, neither Mr. Tindale nor myself contracted any respiratory infection. This may be due to the lower virulence of the local causal organisms. We both contracted "colds" when, after two months' isolation, a party arrived from Adelaide. I have seen no case of sero-purulent nasal discharge among natives.

Hunt and Johnson (1923) record:

It is interesting to note the number of children having an excessive secretion from the nose ("snuffles") during the secondary stage of yaws.

They are speaking of Samoans, among whom, they say, syphilis does not exist.

Later Basedow (1932) writes:

Such a hold, indeed, has the disease in certain tribal localities that it would be a difficult task for anybody to attempt to draw a hard and fast line of discrimination between the congenital and acquired form. Syphilis in the acquired form presents certain peculiarities in the aboriginal. Its primary and secondary manifestations are, generally speaking, less conspicuous than in the European. The affections of the third period are, however, both typical and severe, but it might be mentioned that in spite

of the disease being so rampant, none of the so-called para- or meta-syphilitic conditions have come under my personal observation.

By far the most common manifestations of the disease in its tertiary stage are gummatous ulcers on the lower extremities, gummatous periostitis of the tibiæ, and the destructive processes in the nasal organ which eventually give rise to the characteristic "saddle nose".

He refers to two figures which could be quite reasonably considered cases of yaws.

years' experience in northern Australia he had seen no evidence of syphilis among the natives. Only five or six cases of primary chancre had occurred in Europeans, and most of these patients had arrived from outside the Territory during the previous few weeks.

From the Chief Medical Officer's reports of health, 1929-1933 (Cook, 1929-1933), the following table can be drawn up from data of the Kahlin Beach Aboriginal Hospital:

Disease.	1929.	1930.	1931.	1932.	1933.
Gonorrhœa	93	59	38	66	33
Granuloma	37	16	29	34	23
Yaws	22	12	6	11	5
Syphilis	Not mentioned.	Not mentioned.	Not mentioned.	Not mentioned.	Not mentioned.
Total cases	369	289	213	207	155

The frequency of corneal opacities is no doubt in large measure a sequel to an interstitial keratitis of syphilitic origin.

Leucomata, except of obviously traumatic origin, were non-existent in the tribes of the Mann and Musgrave Ranges in 1933. Those opacities which are so commonly seen in the corneæ of natives in more settled areas of the centre and far north, and occasionally associated with staphyloma or rupture, are undoubtedly gonorrhœal in origin. I saw over a hundred cases of gonococcal ophthalmia (confirmed by microscopical examination) in 1934 at Alice Springs and at Victoria River Depôt.

A well-marked icterus is often recognised by the yellow coloration of the conjunctiva (Basedow, 1932).

I saw no indication of this in the eyes of over 300 natives, and Professor J. B. Cleland and Dr. J. H. Gray (personal communications) say they have never observed this at the various localities in which they have worked in central Australia.

The tongues of adult sufferers are not infrequently covered with pinkish, warty papules; this being particularly noticed in persons whose teeth are decayed.

This condition was seen in a child and a youth in the Musgrave Ranges (1933), both of whom appeared quite healthy.

Condylomata generally appear about the anus, especially in children; in the case of children small ulcerations and fissures also occur around the mouth.

These are probably metastatic (secondary) skin lesions of yaws.

The periostitis and osteitis following the gummatous lesions on the tibiæ often produce a thickening and curving of the bone, known as the "sabre-blade" deformity, which is at times wrongly referred to locally as the "boomerang leg".

This is a very subtle differentiation which, unfortunately, Basedow does not complete.

When I discussed the problem of the existence of syphilis in the Northern Territory with Dr. C. E. Cook, the Chief Medical Officer and Chief Protector of Aborigines, he was quite definite that in eight

Dr. Cook's opinion is supported by that of the other officers in the Northern Australian Medical Service.

Many cases of gonorrhœa in Europeans, contracted from native women, occur each year; if syphilis existed to any great extent among the aborigines, primary chancres and later lesions would have been seen among Europeans.

Professor J. B. Cleland assures me that (taking into consideration the existence of yaws among the natives of central Australia) he has seen no condition among them which he would consider as definitely syphilitic in origin. The case reported by Cleland (1934) as possibly syphilitic is more likely to be one of yaws.

In concluding this section one may quote Koch (1900), who, in his report to the German Government, states:

In the Bismark Archipelago I have seen places in which almost all the children were affected with yaws . . . even the children of Europeans occasionally suffer from it. Very often frambœsia is mistaken by laymen, and even by medical practitioners, for syphilis, and I feel warranted in assuming that the statements as to the great diffusion of syphilis in the South Sea, and particularly in the German colonial region, are based on the confusion of syphilis with frambœsia.

I am in complete agreement with this statement if it be applied to the Northern Territory of Australia. There is no proof that syphilis occurred in Australia prior to European contact, or that syphilis is, or was at any time, prevalent among the aborigines.

References to Yaws.

On coming to the direct references to yaws there is less difficulty. From the reports of Breinl (1912), Holmes (1912), and Breinl and Holmes (1915) one learns that yaws was prevalent in the coastal country of the Northern Territory. The presence of yaws among the natives in this area is now well recognized, and its treatment is one of the duties of police officers.

Basedow (1932) writes:

Yaws is widely distributed over Northern and Central (*i.e.*, tropical and sub-tropical regions of Australia) Australia. I regret to record that during the years of personal observation I have been able to record a perceptible increase in the number of cases met with in the camps. I found the disease particularly rampant in the Northern Kimberleys of Western Australia and in the western rivers district of the Northern Territory. In Central Australia it is less common and sporadic in its appearance. It was surprising to me to find a case in the extremely arid country immediately south of Lake Armadeus. Yaws particularly affects aboriginal children of tender years.

Speaking of the secondary lesions, he writes:

The face, neck, chest, legs and anal cleft are particularly favoured by the disease.

The patients, especially the children, are very uneasy, complain of the irrepressible itch and pains in their bones when attempting to sleep at night.

He writes of chronic ulcers:

Where the limbs have been affected, the scar which is formed after the sores have healed becomes very tense and glossy.

He disagrees with Breinl and Holmes (1915) when they say that the disease is of little practical importance among the natives, although they recognize its prevalence.

He reports having seen cases of gangosa in the northern tropical belts and also over a considerable part of the arid central area. He speaks of the popular misdiagnosis of cancer for gangosa and "cannot recall a single case of face cancer from any tribal district". He describes and illustrates the case of a boy, aged fifteen years, from Port George IV, with active gangosa, and writes:–

Other manifestations of disease were several prominent gummatous ulcers upon the anterior crest of each tibia which were characteristic of those seen in cases of yaws.[1]

Mr. N. B. Tindale (personal communication) says that he saw natives with fissured and sore feet at Groote Eylandt and Roper River (Northern Territory).

Cleland (1933), writing of natives seen at Mount Liebig, states:

The skin and subcutaneous tissues of a number of individuals were thickened and coarse, and tended to crack, giving a kind of crocodile-skin appearance. Probably the extremes of temperature (the days being often in early spring 32·2° C., or 90° F., or more, and the nights perhaps being below freezing point) account for this.

These cases resemble those that I observed in the Musgrave Ranges. It is probable that these lesions resulted from yaws.

Attention may be called to a paper by Hale and Tindale (1934), in which they write:

Many of the Kokolamalama people talk rather indistinctly, with markedly aberrant aspirated "d" and "w", strongly voiced "th" and "s" and "f" sounds which are absent in their neighbour's speech. It was noticeable that several individuals of this tribe suffered from palatal abnormalities, and the above-mentioned modification may be due to this factor, the manner of speech of the abnormal individuals having become the norm for the others of the group.

[1] Compare Basedow's description of tertiary syphilis above.

They say (personal communication) that yaws was seen at Princess Charlotte Bay (north Queensland), where this tribe lives, and also that some natives had facial disfigurement which they would now recognize as gangosa.

References to "Irkintja".

In 1934, at Alice Springs, it was found that many natives (Aranda tribe) attributed the scars which were associated with "boomerang legs" to a previous attack of *irkintja*, and by further inquiry I was satisfied that this was a specific term and not used for sores in general.

Basedow (1932) refers briefly to the description of the tradition of *irkintja* given by Spencer and Gillen (1899), which is as follows:

In the Alcheringa (mythologically distant times) one of wandering parties of the Achilpa, or wild cat men, coming from the south, were under the guidance of a famous old man renowned for the size of his penis. He was always gorgeously decorated with down, especially about his penis. This party camped near the Ooraminna rockhole and performed certain initiation rites. They discovered a group of wild cat men suffering from the disease called Erkintja, who smelt most offensively. The southern Achilpa men had intended to settle there, but the presence of these men frightened them and they hurried northwards. Shortly after the wild cat men had gone a party of men belonging to the Arwarlinga (a species of Hakea) totem, who dwelt close by in the sandhills, came in and went to the top of the Ooraminna rockhole and made a drink by steeping Hakea flowers in water. Then, opening veins in their arms, they allowed the blood to flow into the vessels containing the drink and mix with it until the vessels overflowed to such an extent that the Ooraminna Creek became flooded and all the Erkintja men were drowned. A stone arose at the spot. Since the days of the Alcheringa this stone has been known as the Alperta atnumbira (the stone of the diseased growth issuing from the anus). Ever since that time the Erkintja has been prevalent amongst the natives. It is believed that old men visiting the stone can, by means of rubbing it and muttering a request to the contained evil influence to go out, cause the disease to be communicated to any individual or even group of men whom they desire to injure.

In a footnote, page 444, they write:

The disease is common amongst the young people, only attacking each individual once. It affects only the glands of the part of the body in the neighbourhood of the sore. At first sight it has much the appearance of being syphilitic in nature, but Dr. Eylmann, who had studied it, is of the opinion that it is distinct from syphilis. It usually appears in the anal region, under the arms or legs, or close to the mouth.

Mr. T. G. H. Strehlow, who has recently been working among the Aranda tribe, confirms the above tradition, and I obtained confirmation of that part dealing with the spread of the disease.

From the footnote it appears that the disease is not syphilis, and all the evidence is overwhelmingly in favour of its being yaws.

Eylmann (1908), on page 441, writes:

One kind of ulcer is the most interesting of all cutaneous diseases among the natives. The Arunta call it "irrakintja" or simply "mamma" (wound). The bushmen of the interior use the first name for it. The natives say that they could contract it only once, usually during childhood. At times the cases in one place increase in a conspicuous manner. Thus at Daly River Mission three out of four

children between the ages of 1½ to 3 years suffered from these ulcers. Usually the parts of the skin affected are those exposed to the macerating effect of sweat or other fluids; in the majority of cases, therefore, the perineum together with the genitalia and parts round the anus have become diseased. Other regions frequently affected are the axillæ and the lips. Often the disease is confined to one place; it rarely occurs in more than three or four separate regions; originating on the outer skin of the genitalia, at times it spreads to the mucous membrane of the penis or the labia pudendi. In the early stages a few various-sized ulcers on an area of skin which can be covered with one's hand are often found. Later they coalesce to form a single ulcer, which in the course of years may become 15-20 cm. in diameter. I have unfortunately not been able to discover how the infection commences. The smallest ulcers I saw were approximately the size of a lentil. The base of the ulcer is bluish red and from some there is a scanty, purulent secretion, from others, however, there is considerable discharge. In the course of time conspicuous, extremely red granulations frequently develop. In an elderly Waramunga native who had come to see me on account of a disease of the bladder the granulations had completely filled the artificial fissure of the penis. The largest lesions of this kind which I saw were 1 cm. in height and 10-12 cm. in circumference. The margin of the ulcer is slightly raised and in most places is well defined. At first it is circular but later it becomes scolloped. The ulcer feels hard and the base does not lie deeper than its surroundings, which are slightly or not at all altered. The neighbouring lymphatic glands, however, are swollen. If the ulcers are small and not numerous, they have, in adults, an insignificant influence on the general health. Pain is present but it does not appear to be very severe. If the ulcer surrounds the anus, the pain often becomes very acute at defecation. Cure takes months or years, and in some cases is never effected. At Kilalpanina Mission I saw an elderly man who had an extraordinarily large ulcer of this kind round the anus. As Missionary O. Siebert told me, it shortly after led to the man's death. The cicatrices lie on a level with the skin and show no tendency to retraction. In exceptional cases they are so insignificant that they escape the eye, but a deeply pigmented stain remains.

With which kind of ulcer do we have to class "irrakintja"? In the interior a kind of ulcer called "barcoo rot" is found occasionally among the whites, which is said to become rapidly larger, and is not very distinct from simple cutaneous ulcers. We find in many hot parts of the earth similar ulcers which have probably been caused by infection of quite insignificant skin injuries; under the influence of the climate and of manifold irritations they assume an obstinate nature. A marked inflammatory infiltration which occasionally persists till the death of the person concerned, accompanies many skin diseases of this kind, as for example the "ulcer of Aden" and the "Malabar ulcer". They do not spare those who have suffered from them previously. The two cases of "barcoo rot" which I saw (they were pointed out to me as such by bushmen) also had caused a swelling of the affected part of the body; however, I believe that they were not at all typical. I am unable to say if this skin disease of the whites is identical with that of the natives. "Irrakintja" differs perceptively in some points from the ordinary cutaneous ulcer. The main difference consists in that one can be taken with the latter more than once. "Irrakintja" also unmistakably resembles lupous ulcers, but it only spreads on the surface and does not penetrate into the deeper tissues. It resembles an ulcerous syphilide when its base lies deeper than usually and has a definitely purulent investing layer. The "tumours of Aleppo", "of Biscara", and "of Delhi" which endemically occur in Syria, North Africa and India seem to be closely related to it. Natives contract these "tumours" (boils) only once, usually during the first years of life. Foreigners likewise have a great predisposition to them. "Irrakintja" however usually spares white people, provided that it is not identical with "barcoo rot". Two Irishmen of my acquaintance maintain that they have suffered from it. It is, however, not unlikely that they had eczema. As domestic animals are also taken with the "tumours" I shall not leave unmentioned that I saw a dog at a Deiari camp on whose genitalia was an ulcer the size of a crown, which could in no way be distinguished from an "irrakintja" ulcer.

As the reader can see, I have not succeeded in identifying "irrakintja" with any known disease. I have to leave undecided whether it is an hitherto unknown cutaneous disease. Naturally one could consider it a simple eczema which has acquired unusual characteristics owing to climatic influence and so on. According to my own convictions the statements of the keenly observant native that anyone who had got over "irrakintja" does not have it a second time deserves fully to be taken into account.

In the northern coastal districts, which have good rainfalls, a skin disease frequently occurs associated with itching, and often covering great portion of the body. The formation of scales may be so extensive that the affected portions of the skin appear a dirty grey colour. In old people the wrinkles of the skin become strongly marked, and slight fissures may develop so that the disease resembles ichthyosis. Occasionally I have also observed in the North a papular exanthema which causes irritation and moderate desquamation. I think it is infectious. In Rum Jungle an old Wulwanga native who suffered from it, often visited me. While we sat talking he used to place one of his hands on one of mine. A few weeks after his first visit I noticed on the back of my left hand some irritating scaly papules which with a vitriol ointment, however, disappeared in a few days. I think it is probable that here we have not two different diseases, but two stages of the same disease.

The occurrence of *irkintja* (*irrakintja*) only once in each individual, and then in childhood, the distribution of the lesions and Eylmann's identification of this condition (the name is used only by the Aranda tribe) with a similar one at the Daly River Mission [in the coastal belt, where yaws is common (Breinl and Holmes, 1915)] gives the impression that *irkintja* is yaws. His description of the character of the scars also supports this conclusion. Later in his description he becomes confused with *granuloma pudendi* and dermal leishmaniasis.

Barcoo rot occurs in Europeans only and is probably dietetic in origin. Professor J. B. Cleland tells me that at one time it was thought that dogs suffered from *granuloma pudendi*. The skin disease which he saw in the coastal areas is still common and is an epidermophyton infection (tinea).

The "ulcer of Aden" and "the Malabar ulcer" are conditions more commonly known as *ulcus tropicum*, the ætiology of which is not definitely known, but is in no way associated with yaws. That Eylmann makes no mention of syphilis bears out the note by Spencer and Gillen (1899) that he differentiated *irkintja* from it.

Basedow (1932), in his introduction, writes:

> The dreaded yaws . . . throughout those parts of the great interior where the Arunndta tongue prevails is known as larrekincha or errekincha.

In the sections on yaws he writes:

> The lesions [of yaws] in obstinate cases become deep ulcers which eat their way deeply into the subjacent and surrounding tissues and discharge a putrid serum. The natives do not discriminate between this and that of typical gangosa.

He deals with gangosa under a separate heading and writes:

> Gangosa is well known to and dreaded by the Arunndta, and other tribes of the interior, who have given it the name errkincha (often wrongly pronounced larrekincha), the derivation of the word being from the Arunndta errekama, meaning "to itch".

He makes no definite reference to the yaws ætiology of gangosa. He brings forward no evidence to demonstrate the identity of *irkintja* and yaws.

The spelling "irkintja" is used on the advice of Mr. T. G. H. Strehlow, who has studied the Aranda language. This is in agreement with the system of phonetics he uses. It is pronounced "air-kintcha", where the "r" is trilled.

In the course of investigations at Alice Springs (Northern Territory) in 1934 it was found that *irkintja* is yaws (Hackett, 1936).

Conclusion.

In this paper there is a critical survey of some references to venereal disease and syphilis in Australian aborigines. It is suggested that, if *granuloma pudendi* is excluded, in most cases the disease referred to is yaws. In a future paper (Hackett, 1936) it will be pointed out that among the aborigines of the Northern Territory of Australia today syphilis is unknown, while yaws is frequent. It will also be shown that in museums in Australia there are aboriginal bones from the southern and eastern areas which show yaws lesions.

It is probably correct to conclude that when Australia was discovered by Europeans yaws was present in all native communities and that as long as they were leading lives not completely divorced from their bush fashion, they still suffered from yaws and not from syphilis. This confirms the suggestion that the descriptions of venereal disease and syphilis were of yaws. It has been taken for the purpose of this paper that syphilis and yaws are two separate diseases.

That the disease known to the Aranda tribe as *irkintja* is yaws indicates that that disease has been endemic in central Australia for a long time.

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THE PROBLEM OF CHILD GUIDANCE: ADAPTABILITY AND DELINQUENCY.[1]

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DURING my stay in London I had the privilege of hearing Alfred Adler, of Vienna, expound two of the major aspects of the problem upon which his school of individual psychology bases its approach: "the pampered child" and "organ inferiority". The third major feature is "the neglected child". All of these resolve themselves into one problem: adaptability to society.

Pampering, neglect and organ inferiority, which also includes mental deficiency and backwardness, all create a sense of inferiority in social contact from which arises an aspiration to superiority or domination. The mind of the individual is not concentrated on doing right, but on being great or superior, which sponsors a wrong attitude towards other individuals and society as a whole. This defect in personality is a common factor in social life, causing much social unhappiness. Only where it goes too far, prompted by emotion or faulty training, and infringes the law, does it officially become delinquency.

The character of the process is determined by: (*a*) conditions within the child; (*b*) conditions without to which he is responsive, namely, the family, the play group, the school and the neighbourhood.

Having crystallized our consideration into these avenues, we must consider how adverse influences in these avenues can be readjusted.

At Boston I interviewed Dr. Healy, of the Judge Baker Foundation. After twenty years' close application to the problem of the individual, he is firmly convinced that delinquency is a social and not a medical problem. The environment exists before the child; he does not choose it.

Given the right environment and management, no child will become delinquent. The responsibility does not rest with the child, but with society. The child bears the punishment. Where social surroundings appear uniform, different individuals give a different response. The conflict wages between fear, inferiority and distrust on the one hand, and courage, faith and love on the other. It dwells in the subconscious mind. It is a fact that in any sustained mental conflict between the intellect and the subconscious, the subconscious always wins. To cure delinquency we must prevent or end that conflict. It is authoritatively held that the subconscious, the character pattern of thinking, positive or negative, is determined by the age of three years. The rest is dependent on the storms that are met. In crises the intellect is dominated by emotion and subconscious patterns of thinking are motivated. We must remember that life is thought in motion.

Conditions Within the Child.

Conditions within the child, whether of the brain, which is the instrument of the mind, or other systems, are all physical. Any condition which makes the child conscious of a difference between himself and other children, which can be transmuted into feelings of inferiority or arrogance, will have a bearing on the character of that child—undernutrition, endocrine disturbance, deformity, or cardiac, gastric, cutaneous, ocular or mental disorders. The disorder itself may be manifest only to the child in his performances or the attention he receives. The deformity of prominent teeth appearing at ten years will be accepted according to the pattern of thinking determined at three years.

We must remove the physical defects or help the child to express himself with credit to himself in spite of them. It is in the way he accepts them—his adaptation—that matters. Mental backwardness should be here considered. While at Baltimore I visited the Phipps Institute, and there my attention was drawn to a review undertaken under the auspices of the institute in 1914 by Dr. MacFie Campbell, now of the Psychopathic Hospital, Boston. He was commissioned by special gift from Mr. Phipps to gather data in relation to mental deficiency in the community.

Locust Point, Baltimore, was chosen as a field for survey, being especially suitable. Locust Point is a shipping industrial area, a tongue of land between the two branches of the Patapsco River, socially and industrially isolated from Baltimore. The population (6,000) contained 1,500 children of school age, and, on account of better records, special examination was applied to 764 children in public school 76. Eighteen *per centum* were found with a mental age three years or more below chronological age. Excluding 22 low grade defectives, these children were followed up seventeen years afterwards by Dr. Ruth Fairbank and compared with the social experience of a control group drawn from the same school period. The dismal forecast of Dr. Campbell has not transpired.

The summary of the 1931 review is as follows:

(1) The subnormal have married and have more children and more divorces.

[1] Read before a meeting of the Mental Hygiene Council of Victoria, August, 1935.

(2) Promiscuity, prostitution and illegitimacy are more frequent in the subnormal group—4 : 3·3.

(3) Affiliation with the social agencies is in a greater percentage in the subnormal group.

(4) An equal proportion was self-supporting in the subnormal group, but not as a whole so comfortable.

(5) Two-thirds of the subnormals are labourers, while two-thirds of the normals have superior jobs.

(6) Juvenile court records were greater in the subnormal group: police court records, subnormal and normal groups, were equal.

(7) Subnormals rarely rose above grade 5; normals rose to grade 8.

(8) Migration is commoner among the normal group.

Locust Point is a community socially interested in itself, and the above seems to indicate that, given the aid of an interested and sympathetic community, the backward child will adapt himself even if no specially scientific arrangements are made on his behalf. The public school at Locust Point, under the headmistress, Miss Miller, is a social centre, with auditorium, gymnasium, library, workshops and special grades for maladjusted and backward children. It not only educates the children, but provides a social centre for their parents, who are very active in its progress.

The community spirit was well exemplified when some shop windows were broken by stones. Police arrived next morning at the school; the delinquents were asked to come forward. The parents arrived and agreed to make good the damage, as they did not want Locust Point in the court and papers. The necessary penalties they undertook themselves.

One of the most influential steps in socializing school life is the advent of a Child Guidance Bureau under the local Board of Education. Two outstanding examples of this were presented at Newark and Minneapolis.

The population of Newark is 500,000—80,000 school children. It is an industrial, manufacturing and shipping centre. The wealthy (10% of the total population) live outside Newark in adjoining suburbs. The suburb is confined and built around and built over by factories, and therefore has a diminishing population. The population is mainly poor—opportunity class. The schools are public, employing 2,500 teachers. Children are admitted at four years. There are two terms a year. The Child Guidance Bureau was established eight years ago, staffed by one psychiatrist, one psychologist and three social workers. Any expansion anticipated was to be by doubling this unit. Special classes have been established for backward children (Binet 50 to 70). Children of below 50 Binet standard are recommended for institutional care; but the adoption of the recommendation by parents is purely voluntary. All children abnormal in appearance or objectionable in conduct are excluded from the special school. This avoids the objection parents might have to their children being in the special school. Children suffer less from being in the special school than they do from being inefficient in the ordinary class — bigger, older, duller than the ordinary child.

Epileptics who have fits in the term are excluded from the special school and readmitted if they are free from fits for five months. A firm stand is taken by the psychiatrict on these points; the educational authority demurred, but finally approved. The social workers, who are also trained teachers, handle half the behaviour problems without reference to the psychiatrist or psychologist.

The social workers can readily deal with the problem of "spoiled" children, suffering from too much maternal solicitude and care and no independence, creating fractious conduct and warped personality. Half the cases referred to the bureau are educational problems and are dealt with by the psychologist and the social workers without reference to the psychiatrist. This procedure is encouraged. Children's intelligence is measured by the Stanford achievement test. Missed periods in arithmetic and difficulty in reading are common problems. Failure of a child of good intelligence is mainly emotional, due to disappointment of the parents and repeated defeat in the educational system. The bureau operates for the whole area; it is entirely within the educational system. This is highly advantageous, as the psychiatrist acts with the authority of the Director of Education in recommending changes. Failure in personality depends on repeated failure in school. A child's experience must be mainly success. No child is allowed to fail in the first four periods (two years of school life). Children are admitted to the school every half year. Eight years ago one-fifth of the children had repeated failures in the first year throughout the United States of America. Elimination of failure is aimed at. Fifteen *per centum* used to fail yearly and therefore suffered disgrace in the eyes of the school and family. After two years at school the sorting process begins. The backward are given special programmes and special classes. They can cooperate and attain success with special attention in backward fields. They are happy and self-dependent. Failures have dropped from 15% to 4%. Elimination requires progressive measure after progressive measure by teachers under the insistence and guidance of the bureau. Teachers remonstrate, but they must find a way to help the children and not fail them. The administration has been converted from orthodoxy to progressive education. Small schools with classes of fifteen have eliminated failure for years. The larger schools, with classes of forty-five, thought this impossible, but they have succeeded. The bureau gives preference and attention to children four to seven years of age, as the problem begins then. If time permits, the older children are dealt with by the bureau, but, if not, they must take their chance. There will in a few years be no problems of the eight-year-old to twelve-year-old children, as they will have been previously dealt with. The bureau is gradually eliminating failures. Teachers in the past were selected for

academic and not for personality study. The education of Newark has taken on a new orientation: that personality study is the first most subtle and difficult function of the education system. Academic achievements come second. Half the present teaching staff will never get the idea, and the progressivists are awaiting their retirement. Twenty *per centum* ought never to be teachers, owing to personality defects, illness, negative temperaments *et cetera*. They are a mental hazard. Give the child a good experience and his personality and self-respect grow. The director recently took a census of opinion from the inspectors—assistant superintendents; every assistant superintendent agreed that personality development was more important than academic work, which was secondary. Regulations and tradition are not allowed to interfere with the hygienic management of any child. Regulations are circumvented by consent of superintendents.

EXAMPLE I.—An example of a case was given by the psychiatrist. A boy was impudent and unmanageable at home and at school was a failure and a nuisance, failing in arithmetic, and hated at school. He was backward, but of normal mentality. He was ordered special attention and teaching in arithmetic to get over his difficulty and was promoted from class 7*b* through 7*a* and 8*b* to 8*a*. Thus he mixed with boys his own age; he felt his feet; his conduct and performances were very good. Two teachers were given the opportunity of taking this boy. One refused; the other made the attempt and she was very proud of his performance and her effort.

EXAMPLE II.—A boy, aged twelve years, was a problem at school, not behaving at home, fighting and impudent in the playground, socially inadaptable, and could not play. The younger brother, three years his junior, was one grade behind him, successful, and adored by the family. The father was definitely hostile to the wayward, backward boy. The boy was suffering crucifixion at home, was playing truant and was a dunce at school. The psychiatrist defended him and put him in a special school, which he did not like. He was transferred with two similar boys, not so bad, to the vocational school, and for a few days they were given any material they asked for, to do what they liked. They did carpentry. At the end of a few easy days of enjoyment the teacher asked where the wood came from. They did not know; so it was kindly suggested that they should find out. It came from the lumber yard near the school. Where did the lumber yard get it? The father knew a lumber yard man, and with this introduction they were helped at the lumber yard. How much did it cost the school? How much did it cost the lumber yard? What profit? Not all profit; there were cutting, storing, delivery *et cetera*. Where did the lumber yard get it? From the ships at Newark. The teacher suggested that they work out the cost and write up what they had done and get the fifth grade master to correct the arithmetic. The eighth grade teacher corrected the composition and suggested improvements. The head teacher and psychiatrist read the report. The three were sent to Newark dock to interview the captain of a ship arriving a few days later. He took them over the ship. It came from Washington, District of Columbia, through the Panama Canal. They learned all about coal costs *et cetera*. The further they went, the more they learned, till every child in the school wanted to go off to the docks.

The end results of this procedure were that the home atmosphere for the boy, his school experience and dignity in the playground entirely changed, and so did the attitude of the headmaster, and the school system changed towards progressive education.

In New York there are 1,200,000 children; 50,000 of these were deferred or repeating for the third time. The Institute of Child Guidance in New York disappeared with the depression. It was treating 500 cases a year at 600 dollars a case—a procedure impossible for general application. It was likened to a hundred-dollar clinic with a five-dollar community.

The bureau staff at Newark grew before the depression to one psychiatrist, one psychologist, thirteen visiting teachers and five clerks, and it was proposed to increase it to two psychiatrists, five psychologists and twenty-eight visiting teachers, at the rate of one psychologist to 10,000 children and one visiting teacher to 2,500 children.

The depression caused decrease to one psychiatrist, two psychologists and three teacher social workers.

It is significant that though many important posts were abolished, the bureau remains. The advantages of the bureau depend on its incorporation in the school system, since it thereby has access to the administration. The result is that all are seized with the importance of the progress in education.

A similar system, called the Child Study Department, is in operation at Minneapolis for 85,000 children. Here the Child Study Department has the cooperation of a health service of fifteen part-time physicians, taken from the practitioners of the community, under the city health officer. Every kind of medical clinic is in operation.

Special classes exist for children with an intelligence quotient under 80; maladjustment is dealt with in special classes, and the pupils are then returned to the ordinary classes. Thus children are helped over the difficulty of left-handedness, visual and hearing defects, and reading disabilities. Specialists in reading disabilities are instructing the general teachers in proper methods. Every child has an individual mental test (Binet) before entering the grades. This is done by kindergarten teachers. Failures are cut down and programmes reorganized for second and third grade work to prevent failure. In ten schools children are classified according to age and social adjustment, because it is recognized that hitherto the school system has caused, not prevented, maladjustment and delinquency. Parent education will be part of the school curriculum.

In this system there are twenty-eight visiting teachers assigned to sections of the city, who coordinate school and home. There are also fifty-seven school nurses, who examine children returning to school after recovery from communicable disease and visit the homes of absentees. This clinic is eleven years old.

As far as my observation went, both in England and America, child guidance clinics outside the educational system could hope only to touch the fringe of the problem. Operating independently, unhampered by regulations, and using their resources largely in educational and research work however, they are of great value. Resolving the

problems, much good is done for the younger children, but the difficulty increases with the age of the child.

Dr. Healy, at Boston, said the results with delinquents were unsatisfactory in about 50%; but Dr. Bronson Crothers, psychiatrist in the Pediatric Hospital near by, said that, as far as he knew, the proportion of unsatisfactory results was nearer to 85%.

Dr. Douglas Thom, of Boston, established his Habit Clinic in 1921. In 1923 other clinics in Massachusetts, State-supported, were begun. They belong to the Research Division of the State Department of Mental Hygiene, of which Dr. Thom is director. The aim is finally to establish permanent or mobile clinics within easy reach of all parents or schools throughout the State of 3,000,000. There are fifteen mental hospitals, costing annually ten to twelve million dollars. His department hopes to diminish this incidence of insanity and improve mental health. His own clinic trains a few students. Apart from this, its functions are purely practical. In addition, Dr. Thom is President of the Community Health Nursing Organization in Boston. This organization employs 110 visiting nurses and three psychiatrist social workers, who educate the nurses and help them with habit difficulties of children in homes visited. The nurses visit about 1,200 homes daily, and thus their influence ranges over a wide field. This organization was of more value to the people than the clinic. A very great deal of good was done by maternal education.

The Associated Charities in New York have followed suit. It will be realized how great the problem of dealing with established maladjustment is when I point out that Dr. Ira Wile, at Mount Sinai Hospital, sees and deals personally with sufficient children in one afternoon (about a dozen), and not all new cases, to keep nineteen other people employed all the week. The question arises: could such a system deal with any tangible proportion of the whole problem?

The Neighbourhood.

While in Chicago I visited the Institute of Juvenile Research. I interviewed Dr. Schrader, the director. Its function is research, and its activities are very wide. In a report on the causes of crime it has much to say on the influences of the neighbourhood. Chicago has 3,500,000 people and is divided into areas of 113 square miles, or areas with not less than 500 males ten to sixteen years of age, for purpose of investigation. There are twenty-eight probation officers serving forty police districts. Eighty-five *per centum* of alleged delinquents do not appear in court, but are dealt with by probation officers; 15% come before the court, and 5% are committed to correctional institutions, mostly for serious delinquencies, the delinquents being mostly recidivists.

In the age period of nine to seventeen years successive years show about the same incidence of delinquency. The average yearly rate of delinquency is 5·2% (1926 series). Five areas showed over 20%, 10 areas more than 15%, 42 areas less than 2%, and 17 areas less than 1%. High rates are adjacent to the central business district, low rates near the periphery, unless the periphery is disturbed by any major outlying industrial development.

Zoning the city with concentric circles, two miles apart, the rates on a radius with outlying areas undisturbed industrially were: 10·0, 6·6, 2·1, 0·8 and 0·9. With outlying areas having major industrial disturbances the rates were: 11·0, 9·6, 7·1, 3·1, 3·3, 6·3, 6·1 and 6·2. Twenty-five *per centum* of the delinquents came from 7% of the population, occupying 6% of the city areas, and 50% of the delinquents came from 20% of the population, in less than one-fifth of the geographic area.

The rates of distribution of delinquents, whether brought before the court or not, are much the same.

The high-rate areas provided more recidivists. Recidivists from high-rate areas appeared before the court more times than recidivists from low-rate areas.

Delinquents in 1900-1906 were concentrated in the same areas as at present. Recidivism always varies directly with the rate of individual delinquents. The rate of juvenile delinquency corresponds to the rates of crime in the area. The same principle applies to the distribution of delinquency in other large American cities, because all large cities produce the same types of area during expansion and growth.

High rates of delinquency are within or adjacent to areas of industry and commerce. The city expands and encroaches on residential areas. Some dwellings are demolished, others deteriorate, renovation being unprofitable. The total result is that areas adjacent to commercial and industrial activity gradually become unattractive for residential purposes. The better-off remove to better areas. The population decreases and accommodation decreases faster. The poorer and less independent remain; community backgrounds alter and deteriorate and become areas of low rents, low income and congestion. Rates of dependency and delinquency correspond. The process of selection and segregation operating on an economic and cultural basis attract into these areas the population groups of the lowest economic status. "Though the nationality of the area may change, the incidence of delinquency in the area remains the same." In thirty years, though the nationality of the people occupying areas has altered completely, the delinquency rate is unaltered. The community background, with its supervision and interest in local happenings, is vital. The best elements have moved away. The area lacks leadership of quality. The area lacks the stability of proper social organization; the rate of delinquency corresponds inversely with the percentage of families owning their own homes. Disintegration of society in these areas is shown by changes in the churches, which either die, move to better communities, federate or take on the function of social agencies. The population of these areas

is unable to act collectively. Leadership such as supplied by university settlement can bring back community life to these areas, create interest of the people in one another, infuse streams of culture and resource from better communities to brighten the gloom and soften the callousness of the existence.

The spirit of the area is generally reflected in the children. The local interest in child welfare is an image of the spirit of the community. The interests of the parent and the child are parallel. The behaviour and attitudes of the child come from the parents, schools, play groups and neighbourhood gangs. We have here to consider general indifference to delinquency, criminal traditions and influences of the area. A study of delinquent cases shows that they are a product of a natural process of development, for which the community as a whole is responsible. The principles enunciated by Adler holds good. Hate, fear and distrust dominate love and faith in these areas. Neglect and inferiority are dominant. The child reacts to the dictates of his subconscious.

Nursery Schools.

Whatever enters an infant's or a child's mind is just as important as what enters its stomach. Unsuitable food may cause indigestion, food poisoning or disease, which may result in death or sickness, brief or prolonged. In short, unsuitable food may end baby's life or completely alter it.

For some years prior to and after 1908, the out-patient department of the Children's Hospital, Carlton, used to be overcrowded with very sick infants suffering and often dying from summer diarrhœa brought about by unwise management of the diet. Public education in regard to this matter had already begun in 1908, as expressed in various movements, such as the Lady Talbot Milk Scheme.

General knowledge of the necessary preparation and care of food has practically eliminated summer diarrhœa from the out-patient departments and reduced infant mortality in Victoria in the first year of life from 80 per 1,000 to 40 per 1,000 in 1934.

The guidance vouchsafed to mothers with such dramatic results in relation to the problems of what enters the stomach can be provided in relation to that which enters the baby's mind.

Physical development depends on physical food; mental development depends on mental food. It is true in both instances that no food means no development, and wrong food means indigestion, either physical or mental.

The importance of right physical diet has been nationally demonstrated and generally accepted.

Brain is the instrument of mind. The activity and quality of that instrument is influenced in babyhood by prematurity and nursing facilities, by food, sickness and temperature, also by touch, smell and muscular activity; later by the things the child sees and hears, but perhaps above all by the attitude, complacent or otherwise, of those around him.

Refinements of physical cure are no substitute for mental management. The infant early begins to discriminate his impressions of touch, warmth, cold, pain, taste, smell, sound and light. Different orders, intensities and combinations of these are recorded, memorized and transmuted into meaning. His repeated responses to these impressions become habits of thought and action and are indelibly recorded and with difficulty overridden. Accumulated experience of impressions, meanings and reactions become habits. Habits of mind become character and this character is firmly outlined by the age of five years—a character which is to be his compass through all the years of his inscrutable future.

The impressions of the first day of life are liable to be more profound and indelible than those of any succeeding day. The child gradually learns to comprehend, then measure and assess the situations occurring in his environment. He reflects the emotions of those around him and copies their interpretations and responses to situations. The infant begins life as a completely dependent parasite and by parental example and application must be transformed into a socially useful, independent citizen. He must learn by successive steps in development to adapt himself to the growing demands and visissitudes of environment.

Through ignorance or inability to create a right environment parents often frustrate the normal social development of the child and cause maladjustment to his environment. The degree of maladjustment determines the resulting nervous tension and abnormal reactions to what would be normal environment. Children do not grow out of these difficulties; unless wisely handled, they grow more and more fixed in their maladjustment.

Reduced to its simplest terms, maladjustment simply means a wrong way of approaching, thinking about and tackling ordinary daily problems. From such nervous tension and inability to find a working way out of their difficulties spring temper tantrums, convulsions, breath-holding, epilepsy, lying, truancy, thieving, crime and insanity.

In England it is estimated that there are three million people suffering from incapacitating nervous disorders, largely created by maladjustment in childhood.

Norton Prince has indicated that 40% of the people in industry are suffering from some degree of neurasthenia. To this situation unsatisfactory adaptation in childhood has largely contributed. Nervous breakdown in middle life is becoming much more common as civilization becomes more complex; the maladjusted are not able to stand the nervous strain of life so well.

There is no doubt that in childhood all these cases would have greatly benefited and these maladjustments been modified by trained guidance in a nursery school, just as trained guidance along the lines of physical care in baby health centres modified the difficulties that resulted in summer diarrhœa.

The current opinion that nervous children grow into adaptable adults arises from the fact that as children grow older they learn to repress their feelings, emotions and fears. This repression only creates tension and results in a great deal of suffering and often leads to a nervous breakdown in middle age or in the face of the social crises which are bound to occur in most lives.

Earnest young mothers receive actually less training in managing the mental development of their children than twenty years ago was available in infant feeding. To make available to the general public the facilities for such learning of simple psychology and child management would create as great a revolution in this field as was witnessed in infant feeding.

The socializing of this movement presents three problems: (i) training the children; (ii) training the mothers; (iii) enabling the mothers to provide (or alternatively providing for them) the necessary physical requirements of the child, for function of body and mind cannot seriously be separately considered. This third consideration applies primarily to those families which economic circumstances have deprived of the means of providing these requirements.

Training the Children.

Training the child in adaptability is nowhere so efficiently undertaken as in a nursery school, where he meets and plays with others of his own age under the guidance of trained persons. He is given right routine and is trained to meet a world of his own standard on his own footing. He is taught cooperation, trust and independence.

Training the Mothers.

Seeing, but yet unseen by their children, through arranged screened windows, mothers can sit and observe and see how their children are guided and handled.

The Establishment of Emergency Nursery Schools.

In the year 1933, prompted by the Minister for Education at Washington, White House authorized subventions from the unemployment relief funds to the States, under certain conditions, for the establishment of nursery schools. In that year approximately 3,000 nursery schools were established. In the year 1934, the year I was in America, the subventions were repeated and the movement was pressed further by the establishing of more nursery schools in still more States.

A report from the Office of Education, issued in 1932, shows that between 1920 and 1930 the number of nursery schools had increased from 3 to 262, more than three-fourths of these having been organized after 1925, with the most rapid increase from 1926 to 1928.

During the year following the authorization in October, 1933, of the Emergency Nursery School Program, a reported total of 2,979 emergency nursery schools in 38 States . . . with 64,491 children from needy and unemployed families were enrolled.

According to the authorization, these schools were under the direct control of the public school system and the State and local relief administrations. Staff costs were paid from earmarked educational grants furnished the States from federal funds; food costs were paid from local relief funds, and material and labor for furniture and equipment and for necessary remodelling of building was furnished from Works Division Funds. Policies were set up, materials prepared and State-wide programs were planned and launched through the help of a National Advisory Committee co-operating with the Office of Education and the Federal Emergency Relief Administration.

In every unit a head teacher was appointed with provisions made for such additional staff as was needed to provide health care, properly planned and cooked meals, proper guidance of the children and help to the parents in the care of their children. Estimating 2-5 persons on the staff of each unit, some 7,448 persons were probably employed under the program.

Miss Mary Dabney Davis, Director of Primary and Sub-Primary Education at Washington, has recently completed, on behalf of the Government of the United States of America, a tour of Germany, Austria, Czecho-Slovakia, Russia, Italy and England. She informed me that nursery school activity was being seriously considered or intensively undertaken in all these countries. In the United States of America this activity had been established widely.

In America the conditions under which subventions from the unemployment relief funds were made by the Federal Government, through State administration, for the conduct of nursery schools, were well exemplified in a nursery school conducted in the Campus of Columbia University under the direct supervision of Professor Hill.

This nursery school provided for 130 children of unemployed parents; the ages of the children ranged from two to four years; it was conducted in four divisions.

Buildings were lent rent-free by local authorities; fuel and lighting were provided by local effort, and sufficient was in hand to tide over the winter. Furnishings were provided by the Salvation Army, who had, by unemployed labour, reconditioned old furniture. Teachers' salaries and food for the children were provided from unemployed relief funds.

As there were not sufficient specially trained nursery school workers for this immense national work, and as one of the aims of the movement was to give employment to unemployed teachers, the Teachers' College, Columbia University, provided a free preparatory course ranging from six weeks to six months, varying with the urgency of the demand for workers. This nursery school is a sample of what is happening all over America. Mr. Hopkins, the Minister for Education at Washington, conceived the idea that to take children of the unemployed into nursery schools was a wise provision for relief. The money is paid for this purpose to the State education authority. The nursery schools have thus become partially incorporated in the State education system.

In Melbourne nursery schools have been established since 1930 and have been steadily growing in

number. The Free Kindergarten of Victoria pioneered this movement and has established at the Kindergarten Training College, Kew, Melbourne, a special nursery school course under the direction of Miss Gutteridge, principal of the college.

The nursery schools in Melbourne are run on the same lines as those under the direction of Professor Hill at Columbia University, Miss Gutteridge having received special training under Professor Hill in 1928 and 1929.

The demonstration centre in Melbourne is in conjunction with the Keele Street Free Kindergarten in open-air buildings, and is well worth a visit. There are in addition four other nursery schools in connexion with free kindergartens, one in a crèche, one in connexion with the psychiatric clinic at the Children's Hospital, and two private nursery schools.

A demonstration nursery school committee was formed in 1930 with the express object of forwarding the nursery school movement in Melbourne. It is seen that the necessary knowledge and the necessary machinery are at hand for the initiation of such a scheme in Melbourne, and it is suggested that such relief work of a really constructive nature be undertaken in Melbourne.

In order that the organization may be more easily handled, it is suggested that the movement should begin with one industrial suburb; when it has been satisfactorily organized other suburbs could be cared for.

It is probable that a percentage of under-privileged children are already in kindergartens, but there is beyond doubt need for the establishment of further facilities for these children, who are suffering from immense handicaps in the miserable, under-privileged families to which they belong. If they cannot be given the help and guidance that they need while still in the critical, impressionable age of childhood, it will be little short of miraculous if they escape unscathed and grow into healthy, happy, profitable children.

I suggest that with all urgency these children be accorded full opportunities for nursery school and later kindergarten facilities, and for the skilled guidance in mental and physical hygiene which will combat somewhat the social evils intensified by unemployment.

There is a group of children who need special consideration, namely, neglected children, either orphans or children from broken homes, most of whom come under either the *Children's Welfare Act* or the *Child Maintenance Act*.

Under the *Children's Welfare Act* (Victoria) there are approximately 4,000 orphans under the age of fourteen years, and 2,500 aged fourteen to eighteen years; under the *Child Maintenance Act* there are 10,000 children living with their own mothers.

About 600 of these orphans are annually admitted to the Children's Welfare Department, and probably 5% of these and more are of the standard 50 to 70 (Binet). The most difficult thing to create for the child is new home surroundings, a new social atmosphere. Payment for children boarded out stops at fourteen years; but of the 2,500 under the *Children's Welfare Act* between fourteen and eighteen years of age, one-half, employed or unemployed, remain with their foster parents. The other half (the worse) drift into institutions of one kind or another. These latter have not been successful in establishing satisfactory social attachments and are often defective. What possibly can be the future of these boys and girls without friends and ability?

The greatest concentration of foster homes is found where claims under the *Child Maintenance Act* for relief of mothers is highest, that is, in the industrial areas. Regeneration of community life in these areas will hardly affect the future of this group of unfortunate children. They represent probably 300 a year to be dealt with by some organized institutional or other method. It is a matter in which a careful follow-up is necessary before any action is taken at all.

I offer no criticism of the administration of the Children's Welfare Department. It is confronted with a difficult task, politically and financially.

Institutional life generally lowers the mental achievement of children. The longer they stay, the more their capacity depreciates. Research in Chicago has shown this. There seems to be very little alternative to it. The coordination of all systems of relief under a Ministry of Public Relief, with proper inquiry and almoner agencies in the suburbs, will go far in improving the service of the better and eliminating the worse foster homes.

A national insurance bill was submitted to the Federal Parliament in 1928, but before it was dealt with the Bruce-Page Government went out of power. That measure provided for sickness, invalidity and old-age benefits. Any measure assuring a degree of statutory relief in sickness will be helpful in relaxing the stress and strain of domiciliary hygiene.

The question of child endowment should be kept in mind in relation to this problem. Though the basic wage is inadequate for a man, wife and three children, 60% of these adults on the basic wage have no children.

Readjustment of Adverse Influences.

It is easy to propose plans; it is very difficult to implement them. Inertia and vested interests bar the way. Those interested must be prepared for amelioration by a process and not eradication by a stroke. I have examined various processes in operation elsewhere, and much of what has been reviewed can be locally applied.

I would suggest the following:

1. That all forms of relief, including sustenance, be distributed through a local inquiry and social service, coordinating and distributing all forms of relief. That suburbs be divided into wards for this purpose. Such an agency and distributing service would be coordinated with the similar agencies in other suburbs by a central almoner authority. To

watch and guide the economic destiny of the under-privileged 20% is the first important step in the management of delinquency. Cooperating with this agency would be the visiting teacher, probation officer and school health nurses.

2. That the city be divided into square-mile areas and the rates of delinquency in these areas be assessed. The highest concentrations, I am sure, will be found in degenerating areas.

3. That nursery schools for children two to four years of age be established in these under-privileged areas, with the cooperation of the unemployment relief department, financed as in America. Gradually the nursery schools can spread to the more improved areas.

4. That a child guidance bureau be introduced into the State school system. A psychiatrist and psychologist should be provided for each 10,000 and one visiting teacher for each 2,500 children, beginning with the under-privileged areas (such as Newark, New Jersey).

5. That the school be made not only a centre of progressive education, but a community centre with auditorium, gymnasium and library; a programme to be promoted around this centre by university groups, churches or other social agencies, enlisting the cooperation and initiative of the parents.

6. That by order of court families be removed from degenerating areas whenever any one of their children infringes the law.

7. That paid probation officers be employed to cooperate with social agencies.

Reports of Cases.

PURPURA FULMINANS: REPORT OF A CASE IN AN ADULT.

By EVA A. SHIPTON AND R. N. BEAZLEY,
Sydney.

Clinical History.

MRS. M.C., aged sixty-eight years, was admitted to the Hornsby and District Hospital at 4 p.m. on February 14, 1936. Four days previous to admission she had felt giddy and sick and had to go to bed. On the same night she had an attack of vomiting and shivering. She did not vomit any blood. On the following day she still felt ill and noticed large red patches on both thighs, which rapidly became black like bruises and were painful on pressure. Similar areas appeared on the back, abdomen, both breasts and arms. Sweats and shivering persisted and she felt very ill and exhausted, and fainted several times. More and more bruises appeared during the next two days, thirst was persistent, the malaise increased, and on the fourth day she was admitted to hospital in a serious condition.

On examination her condition was obviously desperate from failure of the peripheral circulation. The blood pressure was too low to be registered accurately; it did not appear to be more than a few millimetres of mercury. The heart was not enlarged and was beating rapidly and regularly; the heart and the lungs appeared to be normal. The temperature was 37·2° C. (99° F.) on admission, but soon fell to 36·1° C. (97° F.) and remained below normal until death. About half the surface area of the body was covered by large black and purple bruise-like areas, bilaterally symmetrical in arrangement, which were extremely painful on palpation and which felt nodular to the examining hand.

No gangrenous or blistered areas were noticed and there was no bleeding from the mucous membranes. The face, scalp and dorsal aspects of the feet were not involved. The patient was edentulous.

The serum failed to react to the Wassermann test. Blood cultures remained sterile.

The red blood corpuscles numbered 4,000,000 per cubic millimetre, the hæmoglobin value was 13·8 grammes *per centum*. No macrocytes or microcytes were present. A few polychromatic forms larger than normal were seen. The cells were regular in shape. There were two to four polychromatic corpuscles in every microscopic field. No nucleated red cells were seen. An occasional form showed punctate basophilia.

The platelets numbered 60,000 per cubic millimetre. They were scanty on the films and a few groups were seen, but the majority were lying singly, were larger than normal, and some giant forms were present on the films.

White cells numbered 9,000 per cubic millimetre. Of these the neutrophile cells were 71%, lymphocytes were 19%, monocytes were 9%, and eosinophile cells 1%.

Of the neutrophile cells, 51 were mature, 19 were band-forms and one was a myelocyte.

The lymphocytes and monocytes were all normal cells. There was nothing in the blood picture to suggest a leucosis as the cause of the condition.

The blood collected for the Wassermann test failed to clot after standing for forty-eight hours and separated into two layers, the upper clear and pale yellow in colour, the lower containing the formed elements of the blood, but, as far as could be judged, there was a complete absence of fibrin and of any attempt at clotting.

The failure of the peripheral circulation continued and death occurred at 3.30 p.m. on the day after the patient's admission to hospital.

We are indebted to Dr. Lawes for the following notes on the condition of the patient before her admission to hospital:

During the last six years the patient had bruised easily and it was noticed that the bruises remained a long time, sometimes many weeks. In February, 1935, she had an attack of vomiting, but no blood was noticed. Also at this time she is said to have passed dark blood and clots *per rectum*, and this had been noticed on and off for many years and had been attributed to the piles from which she suffered. From this time until her death she was liable to attacks of vomiting at irregular intervals, but was never known to vomit blood.

Some months before her death she attended the hospital as an out-patient, complaining of epigastric pain. An opaque meal failed to reveal any lesion and apparently the symptoms settled down on the usual alkaline powder.

Two weeks before her death she is said to have noticed blood in the stools, but did not seek medical advice.

Post Mortem Findings.

Post mortem examination was made one and a half hours after death.

The external examination of the body revealed an obese, elderly woman with extensive bilateral subcutaneous hæmorrhages on the back, thighs, arms and lower part of the abdomen. The sternum, the lower part of the chest, the feet, face and scalp were free from hæmorrhages. The hands and ears were pale purple and œdematous. The punctures on the thumb and arm over the cubital vein, where blood had been taken, were very noticeable. No gangrenous or blistered areas were seen. There was no bleeding from the mucous membranes, and the palate and tongue were free from hæmorrhages.

The blood had not started to clot and flowed freely when incisions were made through the hæmorrhagic areas. The surface of the skin where hæmorrhages were present felt nodular,

The fatty layer was about two inches in depth, and in parts the hæmorrhages did not extend into this; in other parts they were present. The thorax was normal.

The liver, spleen and kidneys were all free from hæmorrhages, as were the mucous membranes of the bowel and stomach. No thromboses were found; in fact macroscopic examination of the organs revealed nothing abnormal.

Smears were made from the sternal bone marrow and parts of the affected skin, liver and spleen were taken for section.

Microscopic Examination.—The smears from the sternal bone marrow were stained by Leishman's stain. The only noticeable feature of these smears was the large number of eosinophile cells, both mature and immature, present and the numerous megakaryocytes. The other cells appeared to be present in normal numbers. There was nothing to suggest leucosis. Sections of the liver showed normal structure. The portal veins were filled with blood. Eosinophile cells could be distinguished in numbers beyond normal. Sections of the spleen showed the Malpighian corpuscles to have the normal structure, but there was a large amount of free pigment present throughout the splenic tissue. There was no increase in the number of eosinophile cells. Sections of the skin showed the epithelium to be intact and there was a complete absence of any signs of inflammation. The blood vessels were filled with blood and there were numerous free red cells in the papillary and reticular layers of the derma. In the hypodermis were numerous hæmorrhages, and in some of the vessels the continuity of the wall was seen to be broken and the red cells were escaping. Areas between the fat cells were filled with blood.

The clinical and pathological diagnosis was *purpura fulminans* of unknown ætiology.

Comment.

Purpura fulminans in adult life is an extremely rare condition and reports of cases are scarce. Henoch[1] was the first to describe the clinical picture. He laid stress on the complete absence of bleeding from the mucous membranes, the extent and rapidity of spread of the hæmorrhages and the quickly fatal course of the disease, the longest duration being four days and the shortest only twenty-four hours. He also mentions the absence of every complication, including embolic and thrombotic processes, and divides this form of purpura sharply from the other forms.

Further experience has, however, modified this view. Naegeli[2] believes that under the name of *purpura fulminans* a heterogenous group of cases had been placed with varying ætiology.

Heinlein[3] reports a case in a child after scarlet fever, in whom bleeding occurred from the mucous membranes and thromboses were found *post mortem*. He thinks that the definition of *purpura fulminans* as given by Henoch has lost all meaning. Minot[4] holds that fulminating cases of *purpura hæmorrhagica* should not be classified as *purpura fulminans* and that the entity should include only those cases showing normal platelet counts and without free mucous membrane bleeding. This would exclude the case here reported, as the platelets were reduced in number. Morawitz's[5] report deals with an adult male with severe purpura, bilaterally symmetrical in its distribution, death occurring in four days. Fever was absent throughout, there was some bleeding from the mucous membranes of the mouth, and a gangrenous stomatitis was present. The blood platelets were reduced to 90,000 per cubic millimetre. The ætiology of the symptom complex apparently varies, but in the majority of the reports is unknown. Some cases have occurred after scarlet fever, during the time which Frank[6] describes as the anaphylactoid phase of the disease, but the severe purpuras which occur during the course of fulminating septic infections, as in streptococcal and meningococcal septicæmias and with smallpox, must be distinguished from *purpura fulminans*.

Heinlein's theory that fibrinopenia is the cause, owing to altered conditions causing damage to the active mesenchyme cell and interfering with the formation of the blood proteins, deserves consideration, as the site of origin of the blood proteins is still under discussion.[7] Hæmorrhagic tendencies due to a shortage of fibrinogen in the blood plasma are mentioned by Pickering,[8] and Baar[9] notes that two cases of congenital deficiency of fibrin in the blood plasma have been reported in the literature.

Frank's thesis[10] is that the condition of *purpura fulminans* is produced by a combination of capillary toxicosis and thrombocytopenia. Castrex[11] in two cases of symmetrical widespread purpura attempted to demonstrate changes in the spinal cord, and it has been suggested that the centres of vascular innervation are concerned in the pathogenesis.

Unfortunately, at the time the patient here reported was under observation we were not fully conversant with the literature, and the spinal cord was not examined nor was the fibrinogen content of the blood estimated.

The presence of large numbers of eosinophile cells in the smears from the sternal bone marrow and in the portal veins is suggestive of an allergic element, which may have been intestinal in origin, affecting both vessels and platelets simultaneously, and possibly being the cause of the previous gastric disturbance. Unfortunately, proof for this hypothesis is entirely lacking.

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(10) F. Frank: *Loco citato*, page 469.
(11) Quoted by P. Morawitz: *"Zum Problem der Purpura Fulminans"*, *Münchener Medizinische Wochenschrift*, September 17, 1926, page 1560.

Reviews.

EASTERN AND WESTERN WOMEN.

In 1930 the anti-Semitic policy of Hitler's government made it desirable for Dr. Magnus Hirschfeld to leave his native land and set out on a world tour. During this tour he delivered numerous lectures on divers aspects of sex. On his return he published a book giving an account of his travels and experiences; this has now been translated into English under the title "Women East and West".[1] In many ways the book is disappointing, for the author attempts to combine matters of somewhat specialized scientific interest with a discursive account of his travels. The result is an unsatisfying hybrid. From the preface the reader is led to hope that the pages which follow will contain a wealth of material on the social, economic and sexual life of women in those countries which Dr. Hirschfeld visited, and a scientific analysis thereof. This hope is not realized, although throughout the book many matters of great interest to the sex expert and sociologist are touched upon and a few are discussed at some length.

[1] "Women East and West: Impressions of a Sex Expert", by M. Hirschfeld; 1935. London: William Heinemann (Medical Books) Limited. Demy 8vo, pp. 339, with illustrations. Price: 12s. 6d. net.

The author's journeyings took him from America to Japan, where, although his stay was a short one, he was able to learn something about the geishas and professional prostitutes, to observe the occurrence of transvestites and homosexuals, and to note the persistence of phallic cults. He stresses the importance to Japan's future well-being of an improvement in the position of women through better education and the suppression of the sale of girls as prostitutes, and of the checking of the over-rapid increase of population. From Japan he went to China, and here he made similar studies of prostitution and sexual misfits, and also of the more or less open, though illegal, traffic in opium and morphine. Particularly interesting to the sex expert is the brief account of certain sex illnesses from which men suffer and "which have no basis in reality, but which play a large part in the imaginative life of the Chinese".

On leaving China he went to Bali and Java, where his attention was inevitably caught by the dances and by the various charms which the natives use to insure or increase their fertility. He also comments on the great admixture of racial types and on the excess of population in Java, which continues despite the heavy mortality from tuberculosis. It is interesting that throughout his journeyings in the East many people came to consult him on sexual matters and that for the most part it was not advice about contraception that they craved, but assistance to promote their fertility. He also found that in all the eastern countries the subject of the determination of sex was one of burning interest because of the all-importance of male offspring.

His route led him from Java to Singapore and thence to Ceylon and India. In this last country the abuses of child marriage, the system of *purdah*, and the widespread cult of the *Lingam* particularly attracted his attention. Unfortunately, although he tells us that he acquired much valuable information on sexual matters during his travels, he gives little information about what he learnt, nor indeed does he tell us much that is new. Furthermore, it is not always clear what information he acquired at first hand and what he learnt indirectly, and, judging from some of his statements, he was not always sufficiently critical of his informants. On two important subjects—miscegenation and the efforts to abolish prostitution—his conclusions are noteworthy. In his opinion, mixed marriages between European and coloured peoples are not biologically undesirable, and he maintains that when such marriages take place between educated men and women of good physical and moral quality they are often very successful and the offspring show no ill-effects from their mixed parentage. Commenting on the notorious Malay Street in Singapore, he writes:

> What I saw both here and later in other British colonies, particularly in Bombay, did not tend to shake my conviction that prostitution can only be dealt with by treating the causes, rather than the symptoms. It can be handled not by closing the brothels but solely by removing the causes that drive young women to prostitution and men to the predilection for it.

At the same time he is opposed to the government control of prostitution, for, as he told the Chinese Minister for Health:

> Prostitution itself is not combated by Government control, and I know by experience that you can only stop a small part of it; besides registering is no protection against venereal disease. On the other hand you brand one group of people and degrade them most unjustly.

His tour closed with a visit to Egypt and Palestine. In the pages dealing with these countries are some interesting comments on the religious and biological aspects of circumcision and on the changing status of Mohammedan women.

In addition to sexology, Dr. Hirschfeld was keenly interested in the political situations in the East. From the sufferings that he and his people had endured as a result of the World War and of anti-Semitism he had a deep sympathy with those who are under the domination of an alien people; and though some of his readers will doubtless feel that his judgements are biased, much of what he has written concerning the relations between the coloured peoples of the East and their European overlords must regretfully be admitted to be true.

There is certainly much in this book to interest both the specialist and the lay reader; but the material is scattered through it with so little arrangement and is so interspersed with descriptive passages and anecdotes that in the main are of little interest, that it is not easy reading. The translation is adequate, but no more.

POST MORTEM EXAMINATIONS.

THE importance of thorough and competent *post mortem* examinations cannot be too strongly stressed. In serious complaints much of our clinical experience must depend on the confirmation obtained at the autopsy, as only 70% of diagnoses made before death are found to be reasonably correct. Even on the *post mortem* table the experienced pathologist may find great difficulty in coming to a correct conclusion as to the course of events, and the inexperienced meet many pitfalls. To both, Theodore Shennan's "Post Mortems and Morbid Anatomy"[1] is a work of great assistance. A copy should be kept in the *post mortem* room so that ready reference can be made to it, if necessary, during the course of routine examinations. The practitioner in the country, who may be called upon from time to time to make a *post mortem* examination, will find the book of much value. The accounts given of the pathological lesions met with in various parts of the body are here available for the general practitioner as well as for the surgeon and physician. Many of us already know and have used the earlier editions, and in this, the third edition, much of the subject matter has been rewritten and the information has been brought up to date. At the beginning a full account is given of the instruments required, the method of making a *post mortem* examination, how to do such an examination in a private house, the various precautions that are necessary, and how to restore the body. Chapter II deals with all the points that may have to be noted in making an external examination, and here much useful and interesting information is given. The earlier chapters are followed by a detailed account of the thoracic contents and the many pathological changes that may be met with in the thoracic organs, and this is followed by a similar account of the abdominal contents; of the central nervous system; of the nasal cavities, ears and eyes; and of the bones, joints and muscles.

Next follows a chapter on autopsies in cases of poisoning, which may prove of inestimable service to a country practitioner with no trained pathologist to consult when he is called upon to do such an examination for the coroner. In this chapter he can see epitomized the lesions met with in various kinds of poisoning and the steps that it may be necessary to take to confirm any suspicions. Finally comes a chapter on medico-legal reports, the *post mortem* examination of still-born and other infants, and deaths under general anæsthesia. The appendix contains notes on preserving museum specimens, embedding sections, and staining. The accounts given of the various lesions are clear and concise, and appropriate references to rare conditions, which may be met with unexpectedly, seem to cover most of the ground.

We have pleasure in recommending this work not only to the morbid anatomist of experience and his younger colleagues, but also to general practitioners, especially those in the country, and to surgeons and physicians.

[1] "Post Mortems and Morbid Anatomy", by T. Shennan, M.D., F.R.C.S.; Third Edition; 1935. London: Edward Arnold and Company. Demy 8vo, pp. 724, with illustrations. Price: 30s. net.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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THE HOBART HOSPITAL.

Most of the readers of this journal know that for some eighteen or nineteen years the Hobart Public Hospital has been the subject of much political, newspaper and medical argument. Royal commissions have made inquiries into the administration of the institution, hospital boards have been appointed and have been dismissed at the instance of the Government, and public opinion has been divided. There is no need at this stage to tell a story that is well known. It must suffice to state that the trouble started soon after the appointment of Dr. Victor Richard Ratten to the position of Surgeon-Superintendent and has continued with exacerbations and remissions ever since. At one period the members of the Tasmanian Branch of the British Medical Association found it necessary to withdraw from attending the hospital as honorary medical officers. About six years ago, however, as a result of negotiations, practitioners of Hobart, members of the Tasmanian Branch of the British Medical Association, accepted positions on the honorary staff and were able to serve the sick public of Tasmania in amity with the surgeon-superintendent. Beds were allotted to the several officers and they were able to have patients admitted to these beds; clinical staff meetings were also held under the chairmanship of the surgeon-superintendent, patients were shown and discussions were held. A representative of the staff was a member of the Hospital Board.

About twelve months ago Dr. Ratten's agreement with the hospital authorities was renewed; he was in receipt of a salary of £2,000 *per annum* and occupied a house rent-free. This agreement was to have expired in four years. An announcement has recently been made in *The Mercury*, Hobart's daily newspaper, that, following a series of sittings of the Hospital Board for the purpose of inquiring into matters relating to the administration of the hospital, the contract with the surgeon-superintendent has been cancelled by agreement. The Chairman of the Hospital Board, the Reverend T. J. O'Donnell, who made the announcement, stated that Dr. Ratten's services were to be retained at a salary of £1,000 *per annum* and that he was to have the right of private practice. Ministerial approval has been given to the arrangement, and applications are being called for the position of surgeon-superintendent so that the appointee will be able to take up his duties on July 1, 1936. The new officer will receive an initial salary of £1,000 a year, rising to £1,250.

Apart from the obvious *volte-face* of the Government, the position is somewhat curious. The surgical work of the hospital will be in the hands of the new surgeon-superintendent and of the visiting surgeons; one of these will receive for his part-time services as much as the surgeon-superintendent receives, and the others will be honorary officers. Since the motives of the Government in this matter are not known, it is useless to discuss it further; doubtless the Ministers believe that they will be able to convince the electors of their *bona fides*. The belief of the electors of Tasmania in the *bona fides* of their government need not concern the medical profession of Australia. What

does matter is that the Hobart Hospital shall no longer be a bone of public contention. The Chairman of the Hospital Board is reported to have expressed his determination to reorganize the old institution and to build up a modern hospital worthy of the city of Hobart. The antiquated buildings are being pulled down to make way for an up-to-date structure. Readers of this journal, however, do not need to be reminded that bricks and mortar do not make an institution. Only a spirit of cooperation and service will make the Hobart Hospital what it should be. It is to be hoped that when the position of surgeon-superintendent is advertised, capable and well qualified practitioners will not be deterred from making application by the past history of royal commissions, changing boards and dissatisfied staffs. There is in Hobart abundant scope for useful work and for the study of disease. The practitioners of Hobart, whether they are attached to the staff of the hospital or not, will, we feel certain, give their support to any honest attempt that may be made to reestablish the dignity and efficiency of the institution.

Current Comment.

ACETYL-B-METHYLCHOLINE AS A VASO-DILATOR.

MORE and more, during recent years, the study of peripheral circulatory disorders has engaged the attention of physiologists and clinicians. To quote one instance of cleverly devised experimentation, an investigator, some years ago, cut the entire nerve supply to the limb of a cat. As a consequence, the arterioles of the limb relaxed and its temperature increased, owing to the augmented blood-flow through it; but the pad of the cat's foot remained normally pale, a clear proof that capillary constriction persisted in the presence of arteriolar dilatation. An injection of acetyl-choline, which is an arteriodilator of great power, did not alter the colour of the cat's foot, since the arterioles were already filled with blood; an injection of histamine, however, produced a vivid flush in the pad owing to its paralytic action on the capillary walls and their consequent response to arterial pressure.

It is not unlikely that most tissue extracts, exclusive of pituitrin and adrenaline, have a lowering effect on the blood pressure when injected intravenously; and it is a fair assumption that the responsible active principles of these extracts are a blend of choline and histamine. Choline is a vagal stimulant and slows the heart beat, while histamine acts as a capillary dilator, though these facts cannot be taken as certain proof that the tissues habitually secrete a body which has a lowering effect on the blood pressure, or that lasting effects follow its injection into the human subject. The nature and properties of choline and its compounds have been the subject of much research during recent years, and both choline and acetylcholine have been isolated from the many animal tissues in which they widely occur. Acetylcholine is known to be a necessary chemical link in the chain of phenomena responsible for parasympathetic nervous stimulation and the consequent tissue response. This substance has an inhibitory influence upon cardiac action and begets increased tonus in the intestinal musculature; it is a vasodilator of the first rank, and acts, as the alkaloid nicotine acts, when its other properties are nullified by atropine, as a powerful agent in raising the blood pressure. Now, acetylcholine is quickly rendered inactive by contact with blood and thus its therapeutic applications are strictly limited. But acetyl-B-methylcholine, which has been synthesized and physiologically tested within very recent times, does not possess this disadvantage; the body esterases do not easily destroy it, so that its properties, similar in general to those of acetylcholine, are exerted whether the drug be exhibited either orally or parenterally. On subcutaneous injection, then, acetyl-B-choline in doses of 2·5 to 25·0 milligrammes produces an increased pulse rate, a fall of blood pressure, bodily flushing and sweats. These results may become apparent inside a minute and continue for twenty more. By mouth, the drug (and now the dosage must be increased fifty or a hundred times) likewise lowers the blood pressure, but causes a slowing of the pulse and notable peristalsis. It likewise has the power, temporarily and only partially, to relieve the small spasms due to slight evidences of Raynaud's disease. Page has demonstrated that injections of acetyl-B-methylcholine are followed by a drop in blood pressure and by an elevation of the temperature of the hands and face. The pulse rate increases and the electrocardiogram commonly shows an inverted *T* wave.

Grace A. Goldsmith[1] has of late studied the effects of acetyl-B-methylcholine, administered orally, on the skin temperature, blood pressure, and pulse frequency of patients suffering from vascular disease. She gave the drug to 29 patients, in doses varying between 50 and 1,500 milligrammes. The experiments were performed in a room of even temperature, after each subject has rested for a period of half an hour or more. To determine the temperature of the skin, thermocouples were fixed to the fingers and toes, and readings made at quarter-hour intervals during several hours. Any

[1] *Annals of Internal Medicine*, March, 1936.

elevation amounting to two degrees or more was disregarded. Three only amongst the tested patients failed to show such a rise and were believed to have received too small a dose of the drug. In 13 cases the elevation of temperature amounted to more than 6° C., and this may be taken as the reaction which typically occurs when vascular spasm rather than the occlusion associated with late hypertension takes place. In cases of Reynaud's disease 5 to 100 milligrammes were effective in producing relief; but 1,000 to 1,500 milligrammes were required to secure dilatation in patients with arteriosclerosis and *thromboangiitis obliterans*. Curiously, larger doses seemed to be required to produce these effects in the blood vessels of the feet than in those of the hands. The oral administration of acetyl-B-methylcholine is capable of producing an average maximal rise of temperature in the fingers or toes of 5·82° C. This effect is subject to enormous variations in different patients with diverse pathological conditions, and also in the several digits or limbs of the same patient. The onset of vasodilatation is, though slow in making its appearance, of long duration, provided an adequate dose of the drug (1,000 to 1,500 milligrammes) be given. Repeated every three or four hours, this dosage will maintain vasodilatation. Let it be understood, however, that no changes of importance have been observed upon the blood pressure following oral administration of this drug, nor any continued change in the pulse rate. This drug, expensive though it is at present and difficult to secure, would seem to be an agent of value at least in the palliative treatment of peripheral vascular disease. It is safe, it is easily given, its action is long continued. The drug is now being produced commercially, but its high cost prohibits its common use. That is not a fact of importance; all useful drugs sooner or later fall in price.

RUPTURED TUBAL PREGNANCY.

IN few conditions is it more imperative that an accurate diagnosis should be made without delay than in ruptured tubal pregnancy. Diagnosis may be extraordinarily difficult, but when once a diagnosis is made and operation is undertaken without delay, the result is as a rule satisfactory. An interesting series of tubal pregnancies has recently been reported from Boston City Hospital by Benjamin Tenney, junior.[1] Tenney has discussed fully one hundred and fifty cases that have occurred during the past eight years. Since diagnosis is the most important aspect of this subject, a brief *résumé* of Tenney's findings will be given.

Satisfactory menstrual histories were obtained in regard to 140 of the patients. Sixty-four, or 45%, gave a history of having missed one or more periods; eight had missed two periods, and one had missed three. If to this number are added 25 patients who had had a very scanty period, with "just a little spotting", a total of 70% of patients had missed one or more periods. One hundred and sixteen, or 82%, of the patients gave a history of irregular bleeding before they were admitted to hospital. In 116, or 77%, of the 150 patients bleeding was present when the patients were admitted to hospital. To this the utmost importance is attached, for it was found that the most acute and the most dangerous cases were those in which no staining was present at the time of the patient's admission to hospital. In these acute cases the patients had been well until they were seized with acute abdominal pain, generally within twelve hours of admission. That these cases are dangerous is, of course, quite understandable, for, as Tenney points out, the absence of obvious bleeding indicates a living pregnancy up to the time of rupture, and therefore a more potentially dangerous source of disaster. Tenney uses amusing jargon in discussing this point: "Three of the five deaths from acute hæmorrhage were not staining on admission." Death in Boston must be peculiar.

In a special article on the diagnosis of extrauterine pregnancy, written at the request of the Editor and published in this journal on July 25, 1931, Dr. E. R. White pointed out that when bleeding occurs from the uterus in extrauterine pregnancy, the blood does not flow from the tube, but comes from the uterine endometrium when the ectopic pregnancy is disturbed. Dr. White drew attention to the scarcity of the blood and attached diagnostic significance to this fact. He also pointed out that the blood lost was usually dark brown, like coffee grounds. In passing, we would suggest that Tenney's statistics should be considered together with Dr. White's excellent contribution.

The physical findings were of interest. The chief complaint of 140 patients, or 93%, was lower abdominal pain, and the pain was usually worse on the side of the pregnancy, but in many cases it was bilateral. Abdominal tenderness was present in 126 cases, or 84%. Pelvic tenderness, either localized or general, was present in 139 cases, or 92%. In 91 cases, or 60%, a pelvic mass could be made out. In 42 cases, or 28%, although a definite mass could not be outlined, a note was made of bulging or of fullness. In other words, in only seventeen cases in the whole series could no pelvic mass or fullness be discovered. An abdominal mass was palpated in eleven instances.

Of the entire series, 26 patients, or 17·3%, were primiparous. In eighty cases in which the history was complete in this regard, 38 patients had had a pregnancy within two years, 19 within five years and 23 within from five to twenty-five years. A long period of sterility was not the rule in this series. Forty-eight patients, or 32%, had had previous abdominal operations, and in all but seven of these the operation was an appendicectomy or a pelvic operation. Only 18 patients had a past

[1] *The New England Journal of Medicine*, April 16, 1936.

history of pelvic inflammation, but when Tenney reviewed the slides sent for pathological examination he found that follicular salpingitis was present in 50 cases, or 33%. The leucocyte count was found to be of value in diagnosis, for in 21 of 25 cases of the acute type with symptoms of less than 24 hours' duration the number of cells was more than 15,000 per cubic millimetre. It was also found that a normal sedimentation rate of the red cells was in favour of tubal pregnancy. The final diagnostic point made by Tenney to which attention should be drawn is that a failure of reaction to the Aschheim-Zondek test excludes a living tubal pregnancy, but does not exclude a tubal pregnancy in which the fœtus is dead.

STROPHANTHIN.

STROPHANTHUS is more toxic than digitalis, and it would appear that the prior exhibition of digitalis is prone to evoke toxic manifestations when strophanthus is administered. Strophanthus, however, is not cumulative to the same extent as is digitalis. Strophanthin may be given by intramuscular or intravenous injection, but as the former may be distinctly irritating, the latter is the more suitable method. When given by the intravenous route, strophanthin should be well diluted and injected slowly. The pharmacopœial strophanthin is known as Kombé-strophanthin and is a mixture of glucosides obtained from strophanthus seeds. This strophanthin is assayed biologically by the frog method, and is diluted, if necessary, with lactose so as to have an activity which is 40% of that of anhydrous ouabain. However, the comparison of the strophanthin under test is not made against ouabain itself, but against a standard strophanthin-Kombé which has been standardized on anhydrous ouabain. Although the pharmacopœia assigns a maximum and minimum dose for strophanthin, there is no unanimity of opinion as to the correct clinical dosage of the drug or of the intervals at which such drug may be repeated safely, or even of the amount which may be repeated. Strophanthin has very dangerous potentialities and its dosage and frequency of repetition should be accurately determined. Ouabain is an amorphous glucoside derived from *Acocanthera ouabaio*. Crystalline ouabain is a strophanthin obtained from *Strophanthus gratus*. The ouabains differ from the amorphous and crystalline strophanthins of strophanthus-Kombé. Crystalline ouabain is said to be more stable than the pharmacopœial strophanthin, but, on account of impurities and lack of constancy in their action, the dose of the ouabains is not entirely satisfactory.

H. E. Rykert and J. Hepburn state that there is a feeling in Canada and in the United States of America that strophanthin is dangerous, and accordingly it is seldom used. For some years, however, Rykert and Hepburn have employed it without any mishaps and with good results when rapid slowing of the heart was desired, mostly in auricular fibrillation.[1] They examined all the case records in the cardiac wards of the Toronto General Hospital during the previous six months. Twenty-nine patients had auricular fibrillation; two had auricular flutter; one had auricular paroxysmal tachycardia, and one had rapid sinus rhythm with occasional changes of the "pacemaker". Some of the patients had never received digitalis, and only one had received this drug during the prior two weeks. Except those too ill to wait, all were observed in bed in the electrocardiograph room for some hours before strophanthin was administered. Heart rates were checked by electrocardiograph and auscultation before administration of strophanthin and two hours subsequently. Note was made of palpitation, cyanosis, subjective and objective dyspnœa, nausea and vomiting. With one exception the dose (intravenously) was invariably 0·6 milligramme (one one-hundredth of a grain). This was repeated in many cases in an hour and in one case was given thrice at hourly intervals. The exception was a lad of eighteen, who was given half the dose, repeated in ninety minutes. The thirty-three patients received about two hundred doses. Vomiting occurred once in four different patients, of whom two had vomited prior to the injection. Of the other two, one did not again vomit, although she had over a hundred doses. One patient died twenty minutes after receiving a single dose. She had received digitalis recently. She was moribund before the administration of strophanthin. She had auricular fibrillation, with a ventricular rate of 144. Ten minutes after the strophanthin was administered the rate was 124. Ventricular extrasystoles appeared, followed by runs of ventricular tachycardia and finally ventricular fibrillation. Rykert and Hepburn point out that digitalis overdosage may be followed by such a sequence; but these changes in rhythm may also occur spontaneously just prior to death. Probably death was hastened by strophanthin in a patient who had received digitalis.

In the patients with auricular fibrillation the average initial heart rate was 153 and the average minimum rate after one dose was 97 per minute. In all but two a definite decrease in heart rate followed the initial dose of strophanthin. In these two the first dose had no effect, but the same dose two hours later was followed by a conspicuous fall in rate. One of these patients had pneumonia with hyperpyrexia. A definite, and at times marked, diminution in heart rate appeared in from five to ten minutes and occasionally in three minutes. The maximum effect was manifest in from 20 to 120 minutes—usually within an hour. When a second dose was given within two hours of the first, the maximum effect was usually obtained about ten

[1] *The Canadian Medical Association Journal*, March, 1936.

minutes after the second dose. When the heart rate was reduced the patients showed considerable improvement in dyspnœa, palpitation, cyanosis and respiratory rate.

Strophanthin was given to two patients with auricular flutter in an endeavour to restore normal rhythm through auricular fibrillation. In one case the ventricular rate was 102. With repeated doses it fell to 54. The ventricular rhythm became very irregular with long pauses and it was not considered advisable to persist with the strophanthin. No toxic symptoms were manifest. In the second case of auricular flutter there was an irregular ventricular rhythm, with the rate varying between 74 and 80. After strophanthin was given the rate fell to 58-60, with long ventricular pauses. In each case normal rate was restored by quinidine sulphate, and in neither did strophanthin reduce the auricular rate.

The results of Rykert and Hepburn agree with those of J. Wyckoff and W. Goldring, to the effect that a large dose of strophanthin given intravenously is safe if digitalis has not been recently administered; also that febrile patients require larger doses and that vomiting is rare. The initial dose advocated by Wyckoff and Goldring is 0·5 milligramme (one one-hundred-and-twentieth of a grain), followed by 0·1 milligramme (one six-hundredth of a grain) every half hour until the required effect is obtained. Rykert and Hepburn recommend strophanthin as a convenient, cheap, effective and safe drug for intravenous use when rapid reduction of the heart rate is desired, especially in auricular fibrillation or when vomiting or marked passive congestion renders the use of the alimentary route impossible or doubtful.

MUMPS ORCHITIS.

THE acute infections are amongst the most important and interesting of diseases; this applies particularly to several of those infectious ailments which afflict childhood. These diseases, such as measles, varicella, mumps and whooping cough, are usually negotiated safely by children, but, as is well known, they may leave more or less permanent sequelæ. General practitioners see most of them and acquire a knowledge which even the most ample of text-books could hardly supplement, but collected information about so important a complication as orchitis in mumps is nevertheless welcome. Mumps seldom causes serious illness, though in certain epidemics meningo-encephalitis has had a high incidence, and such complications as labyrinthitis and deafness cannot be regarded lightly. Alfred Stengel has recently reviewed the current literature dealing with the orchitis of mumps.[1] He refers *inter alia* to reports of epidemics during the World War; such experiences have been paralleled here. No one who has seen large numbers of strong young men seriously ill with mumps could fail to be impressed with the significance of the adult disease; the hyperpyrexia so often seen as a concomitant of orchitis was in itself a striking feature.

One interesting point about mumps as an infectious disease concerns the degree of immunity it affords; this has been argued a good deal, but a definite protection usually appears to be conferred by one attack. The cause is generally believed to be a virus, and there can be no doubt that the accompanying orchitis is due to the same agent. The actual route by which this remarkable metastasis is achieved is less certain. That there is some relation between infections of the parotids and of the genitalia is known, and some writers have assumed that the virus was transferred by manual contact. This has been disproved by careful experiments during epidemics, and metastatic spread by the blood stream seems to be the probable route; but why the gonads should be so selected is obscure. Trauma has been blamed as a contributory cause, but this shirks the real question; moreover, orchitis occurs as frequently in patients kept at rest. It is agreed that mumps orchitis is uncommon in children; it practically never occurs before puberty; after this it attacks chiefly the adolescent.

There is little to be said on the subject of diagnosis; this is usually easy, though Stengel points out that the orchitis may precede the parotitis by some days, making the position temporarily obscure. Isolated mumps orchitis without any parotitis has been described by a number of writers, but though this probably occurs, it is difficult to prove.

As regards treatment, one suggestion of possible value is the use of convalescent serum, following the encouraging practice in other infectious diseases. This appears to be of promise, and in severe and complicated cases should be tried. The only other important point in treatment concerns the possibility of sterility or impotence as a sequel. Epididymal involvement has been described, but this is not a common or important feature; the important changes occur in the gland itself. Very little is known of the actual pathological changes during the attack, but there appears to be an involvement of the tubules and of the interstitial tissue. The end state is one of a parenchymatous sclerosis. A striking clinical feature of the condition is the extreme tenseness of the gland; it is this pressure on the unyielding *tunic albuginea* that causes the severe pain and tenderness. This has suggested the possible value of surgical incision, a course which has been followed with apparent success by numbers of authorities. The tunica is simply incised along its anterior surface, allowing the organ to bulge through the capsule. This conservative procedure might well be adopted when an orchitis is of such severity as to threaten the possibility of future atrophy, especially when the inflammation is bilateral.

[1] *The American Journal of the Medical Sciences*, March, 1936.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Lichen Simplex Chronicus.

D. CLEVELAND (*Archives of Dermatology and Syphilology*, February, 1936) gives an analysis of 170 cases of *lichen simplex chronicus*. The condition occurs principally during adult life; it usually appears later in men than in women, and considerably more often in women. The disease occurs almost three times as often in brunettes as in blondes, and more frequently in Japanese and Chinese than in people of European origin. While preserving a strict identity, it often occurs in association with other chronic diseases of the skin and is commonly confused with them by the physician. The neurogenic factor does not occur with sufficient frequency to justify regarding the disease as a cutaneous neurosis or giving it a name implying a constant neurogenic ætiology. Consideration of the proportion of cases occurring in various occupations does not show that it affects chiefly persons with a high nervous organization, who are correspondingly reactive to nervous and psychic stimuli. Allergic phenomena are considered an important ætiological factor, and in many cases it is believed that the primary symptom — pruritus — is itself an expression of allergy. Local trauma, usually minimal, but regularly repeated over a long time, is believed to be the chief single factor in the ætiology. This may arise from such circumstances in the environment as friction, scratching, rubbing or pressure from clothing or in association with various postures or movements connected with occupation, or it may be produced by the patient's activities in response to pruritus arising from internal causes. The best single agent in therapy is X radiation.

The Determination of the Presence of Fungi in the Skin.

J. H. SWARTZ AND NORMAN F. CONANT (*Archives of Dermatology and Syphilology*, February, 1936) give a method for the determination of the presence of fungi in the skin and discuss the nature of mosaic growth. It is stated that the treatment of scrapings from the skin with 5% potassium hydroxide, followed by washing with water and staining in lactophenol and cotton blue, makes possible the easy determination of the presence of fungi. This method of preparing microscopic specimens for examination is simple in that it adds only two steps to the commoner method of using potassium hydroxide, and is effective in that the fungi are definitely stained while the various confusing artefacts are eliminated from the picture. This is particularly true of the mosaic growth which occurs commonly in preparations made with potassium hydroxide. This material does not seem to be the result of treatment with potassium hydroxide, since it can be found in scales treated with xylene or with chloral hydrate and acacia. It was found to be soluble in ether, 95% alcohol, absolute alcohol and phenol. It could not be stained with Sudan III or scarlet red, or blackened with osmic acid. While fungi were readily stained with lactophenol and cotton blue, mosaic material which occurred in the same preparation did not stain, and was in fact entirely eliminated. In the presence of polarized light there was no evidence that the mosaic material was composed of crystalloid forms. Whatever the nature of the mosaic growth, the authors feel that they have presented sufficient proof that it is not a fungus. The staining of normal fungi in scales with lactophenol and cotton blue, the failure to find partially degenerated forms in the same preparation in which both mosaic material and fungi occurred, and the failure to find morphological connexions between normal hyphæ and these mosaic forms seem to disprove convincingly the theory that this material is a degenerate form of fungus.

Gold Dermatitis with Hyperkeratosis.

A. C. ROXBURGH, A. P. M. PAGE AND D. GORDON (*The British Journal of Dermatology and Syphilis*, March, 1936) report a case of gold dermatitis in a patient with arthritis following treatment of the arthritis by intramuscular injections of a gold preparation, "Solganal B. oleosum", together with calcium gluconate given thrice daily by mouth; calcium gluconate is alleged to protect patients from gold dermatitis. The patient also had "Progynon" by injection and by mouth. After twelve injections of "Solganal B." (1·24 grammes of aurothio-glucose) an erythema developed, followed by severe swelling of the face and eyelids and a weeping condition of the skin of the neck and chest. Later, a hyperkeratotic, warty condition developed over most of the body and limbs, being so pronounced on the limbs as to suggest gonococcal hyperkeratosis. Gold was found in scrapings from the warty lesions. The patient was admitted to hospital and treated with injections of sodium thiosulphate and ascorbic acid, neither of which produced any perceptible effect. In addition, she was given X ray treatment and local applications. Throughout her four months' stay in hospital the patient was afebrile and the urine contained only a trace of albumin on two occasions.

Erythema Nodosum.

LOUIS FORMAN (*The British Journal of Dermatology and Syphilis*, March, 1936), in a study of 31 cases of *erythema nodosum*, divides the condition into two groups in respect of: (i) the age of the patient, (ii) associated throat infections. In adults repeated attacks are associated with throat infections, for which immunological evidence of the hæmolytic streptococcus as the provoking organism is given. The nodes in adults are frequently large and redder and more tender than in children. Further, the prognosis in adults does not seem to be so grave as in children, in whom the attack of *erythema nodosum* may be associated with radiological or other evidence of tuberculosis.

Amyloidosis of the Skin.

Two cases of localized (lichen) amyloidosis are reported by Ruben Nomland (*Archives of Dermatology and Syphilology*, January, 1936). The first was of twenty-three years' duration in a man, aged fifty-three years, with deposits of amyloid in the skin of the legs. Posteriorly the eruption consisted of discrete, slightly scaling, firm, brown papules, varying in size from that of a pin-point to three millimetres in diameter. Anteriorly, over the tibiæ the papules had coalesced into infiltrated plaques resembling those seen in cases of *lichen simplex chronicus*. The second case was that of a man, aged fifty-five years, and was of several months' duration. The location of the lesions was almost identical with those in the first case, but the eruption consisted only of papules almost the colour of normal skin and not more than one millimetre in diameter. The reaction to the intravenous Congo red test for amyloid (Bennhold) was normal in both cases. Following subcutaneous injection of the same dye in the first case the amyloid lesions took a rosered colour, which was retained for months. On the basis of a similar result in a case of systematized amyloidosis with cutaneous lesions and seven negative results in disorders simulating localized amyloidosis, this is proposed as a specific diagnostic test for cutaneous amyloidosis, though in the second case it was necessary to inject the dye intracutaneously to stain the amyloid papules. In both cases, as is true of most reports, the deposit of amyloid in the skin is felt to be a primary and not a secondary process. Evidence was seen in both cases to indicate that the amyloid was deposited in small preformed bodies (cells) about the capillaries of the papillæ rather than in the tissue spaces. By peripheral growth fairly large homogeneous subepidermal masses of amyloid were found in the first case. While it is felt that localized amyloidosis in these cases was primary in the skin, no theory of the ætiology can be offered. The long duration in the first case and the failure to find any evidence of other disease in the more recently developed second case indicate the benignity of localized amyloidosis of the lichenoid type.

UROLOGY.

Essential Renal Hæmaturia.

F. CIMATTI (*Urologia*, June, 1935) contributes to the study of essential renal hæmaturia from a fresh point of view, namely, the possible influence of reno-renal reflex. The author describes a case of unilateral renal hæmaturia of long duration in a patient whose opposite kidney was affected with pyelitis. In such a subject, constitutionally predisposed to weakness both of the vessel walls and of the tone of the autonomic nervous system, the hæmaturia which had resisted medical and operative treatment, ceased immediately and definitively after lavage of the opposite renal pelvis with oxycyanide of mercury. From the study of his case and of the results obtained by recent experimenters the author maintains that he is justified in attributing the hæmaturia to a contralateral effect, explaining the succession of phenomena by physiological reno-renal correlations which have been certainly proved. These correlations, including vasomotor manifestations in subjects constitutionally predisposed, are explained after consideration of the complex renal innervation.

Pyelography in Polycystic Kidneys.

M. R. DREYFUS (*Journal d'Urologie*, September, 1935) advocates retrograde pyelography in the diagnosis of polycystic kidneys. The most frequent appearance on the film is that of enlargement and multiplication of the pelvi-calycine elements. The infundibula are elongated and drawn out, sometimes to a great degree in the case of the superior division, which stretches in a cephalic direction parallel to the vertebral column; the inferior division stretches in a caudal direction, but to a less extent. The major calyces bifurcate, and even trifurcate, so that there are an increased number of minor calyces. The upper portion of the ureter is often incurved, so that it encroaches on the vertebral bodies in the film. It is very important to note that the appearances described are usually bilateral, though they may be more highly developed on one side. At the other extreme in the gamut of pyelographic appearances in this disease there is seen, though only rarely, a non-dilated pelvis, with slightly dilated superior infundibulum, on which are implanted a very few short, stumpy calyces. The inferior infundibulum shows little change and the direction of the ureter is not modified. Between these two extremes are many appearances, which, however, being less strikingly unusual, are not so easy to diagnose. The pyelographic deformities caused by polycystic disease have to be distinguished from those in renal carcinoma. In the former the deformities tend to be general throughout the organ, and while the major calyces are narrowed and elongated, the minor or true calyces are usually unaffected. In carcinoma the disease, at least at first, is usually confined to one pole, and while major calyces are often narrowed, the minor calyces near the growth are usually invaded and therefore are obliterated or seriously deformed. In all cases of doubt a retrograde pyelogram should be done on the opposite side, for bilaterality, even if of unequal degree, points to polycystic disease.

Decapsulation in Glomerular Nephritis.

C. LOBO-ONELL AND P. GAUME (*Journal d'Urologie*, May, 1935) consider that acute diffuse glomerular nephritis always tends to become an established chronic form unless this serious evolution is prevented by some means. They consider that decapsulation should be used not only in cases of oliguria, but also in all cases presenting grave symptoms of any kind. In the subacute and chronic diffuse forms decapsulation may also sometimes be used with benefit, especially when, in chronic cases with hypertension, hæmaturia or an acute exacerbation occurs. The other group (according to the German classification) of glomerulo-nephritis is the focal type. In the pure focal type, charactertized clinically by prolonged hæmaturia, with neither hypertension nor œdema, decapsulation should be of use, but the authors have so far no experience of its use in this type.

Physio-Pathology of the Ureteric Musculature.

H. BLANC (*Journal d'Urologie*, October, 1935) considers that in the light of new observations which he presents, the problem of the ætiology of uretero-hydronephrosis may benefit by adducing conceptions which entail the occurrence of toxic inflammation of the nerves supplying the ureter. In the personal case presented here an abscess surrounded the lower end of the ureter in the region of the base of the broad ligament. Transperitoneal operation with incision of the peritoneum overlying the ureter, so that the latter canal could be directly inspected, showed that the duct was dilated to the diameter of the duodenum, yet no sign of inflammation was present. The author suggests that the cause, in this and other similar cases quoted, is a toxic inflammation of the nerves running up from the lower end of the canal. He contends that only the muscularis and the adventitia contain nerve fibres, none being present in the mucosa and submucosa. He distinguishes two main groups of ureteritis: (i) endogenous, provoked by germs carried in the urine itself, attacking the mucosa and submucosa and not causing, as a rule, any dilatation of the canal, except above a stricture, which may form much later; and (ii) exogenous, provoked by peri-ureteric infections, or propagation to the adventitia by the lymphatic route, not reaching the mucosa, but affecting the nerve plexuses of the adventitia and muscularis, leading to transitory or even permanent dilatation of the duct. Exogenous infection first affects the external of the two muscular coats, the circular layer, paralysis of which causes dilatation, then the inner or longitudinal layer, paralysis of which leads to lengthening and, secondarily, to plication or tortuosity of the canal. In the case quoted by the author, evacuation of the abscess, which had been proved not to be causing mechanical obstruction, led to such rapid retrogression in the diameter of the ureter that intravenous urography only six weeks later revealed a canal of normal diameter, functioning healthily. Repeated or prolonged attacks of toxic neuritis may end by causing a permanent uretero-hydronephrosis. The original cause, by lymphatic or direct connexion, may be in the appendix, the seminal vesicles or the female internal genital organs with secondary lymphangitic or lymphadenitic effects in the base of the broad ligament.

Achalasia of the Pelvi-Ureteral Sphincter.

R. ALLEMANN (*Zeitschrift für Urologie*, June, 1935) describes the technique for extra-mucosal division of the pelvi-ureteral sphincter muscle in cases of achalasia of this muscle. In the course of four years the author has proved the worth of this operation in twenty cases. The small incision is about two centimetres long, its centre being exactly at the ureteropelvic junction. At this point the wall of the canal is lightly grasped with two mosquito artery forceps and a fine, sharp knife makes the incision between these forceps. In order that precision in reaching the mucosa and no further is obtained, the operator should wear a pair of strongly magnifying spectacles. When the incision is properly made, the bluish mucosal layer bulges a little through it.

Treatment of Renal Polycystic Disease.

L. MOTTA (*Journal d'Urologie*, October, 1935) declares that decapsulation of the kidney followed by puncture of all superficial cysts with the thermo-cautery relieves the patient of pain and hæmaturia in polycystic disease and, moreover, improves the renal efficiency for some time. A recent case in which unilateral pain was relieved by this means is presented. About a year later the opposite kidney gave rise to similar symptoms, with equal relief following the same surgical treatment. Great improvement in the efficiency of both kidneys was still present six months later, and the patient is able to follow the arduous occupation of able seaman.

Special Article.

(Contributed by Request.)

HYDROGEN ION CONCENTRATION, ACIDOSIS AND ALKALOSIS.

THERE seems to be much uncertainty in the minds of many medical practitioners as to the meaning of the term "hydrogen ion concentration" and the true significance of the terms "acidosis" and "alkalosis" and an explanation of the terms might be useful.

When an acid is dissolved in water it dissociates to a greater or less extent to anions and cations. Thus if we represent any acid as HA we get $HA \rightleftharpoons H^+ + A^-$. Similarly, an alkali in solution, BOH, dissociates to B^+ ions and OH^- ions. Pure water itself dissociates to a very small extent into H^+ ions and OH^- ions, and obviously there must be an equal number of H^+ and OH^- ions. In pure water or any watery solution the relation between the concentrations of hydrogen and hydroxyl ions is given by the equation

$$\frac{(\text{Concentration of } H^+) \times (\text{Concentration of } OH^-)}{\text{Concentration } H_2O} = k(\text{constant})$$

Now the concentration of H^+ ions or OH^- ions is always extremely small in relation to the total water that we may take the concentration of water as constant and write: (concentration of H^+) × (concentration of OH^-) = K, or, symbolically $[H^+] \times [OH^-] = K$, where the square brackets represent concentration. At 22° C. $K = \frac{1}{10^{14}}$ or 10^{-14}. In pure water $[H^+] = [OH^-]$ and the fluid is neutral in reaction, so the concentration of hydrogen ions must be $\frac{1}{10^7}$ or 10^{-7} or $\frac{1}{10,000,000}$ gramme per litre. This relation holds, even when acid or alkali is added to the water. If acid be added, hydrogen ions will come from its dissociation, so there will be more hydrogen ions and correspondingly fewer OH^- ions. Thus in a decinormal solution of a strong acid dissociation is nearly complete, so that the hydrogen ion concentration is practically 10^{-1}. The OH^- ion concentration then will be 10^{-13}.

A neutral solution has a hydrogen ion concentration or C_H of 10^{-7}. Any figure with an index numerically less than 7 means that the solution is acid, and any with an index greater than 7 that the solution is alkaline. Thus $C_H = 10^{-6}$ means an acid solution, and $C_H = 10^{-8}$ means an alkaline solution.

The C_H of arterial blood serum is about 4×10^{-8}, that is, very slightly alkaline. This method of expressing hydrogen ion concentration is cumbrous, so another method is used which is simpler to write but requires care in interpretation. This is the pH nomenclature. Here the negative logarithm of the C_H value is taken, that is, $\log \frac{1}{C_H}$. The negative logarithm of 10^{-7} is 7, and so on. Thus a solution with pH = 7 is neutral; anything less than 7 is acid, and anything greater than 7 is alkaline. The C_H given for arterial blood $C_H = 4 \times 10^{-8}$ becomes pH = 7·4. The point which requires care is that a solution with a pH = 6 has ten times the concentration of H^+ ions of a solution of pH = 7. It is easy to see that a solution with $C_H = 2 \times 10^{-7}$ has twice the concentration of hydrogen ions of a solution with $C_H = 1 \times 10^{-7}$, but not so easy to appreciate that pH = 6·7 means twice as many H^+ ions as pH = 7.

An acid is strong or weak according to its degree of dissociation in solution in water. Thus hydrochloric acid is a strong acid (in a decinormal solution it is 91% dissociated), while acetic acid is a weak acid (a decinormal solution is dissociated to the extent of only 1·3%).

The C_H of a decinormal solution of hydrochloric acid is then $9·1 \times 10^{-2}$, or pH = 1·04, and for the acetic acid $C_H = 1·3 \times 10^{-3}$, or pH = 2·89. Carbonic acid is a very weak acid, and this is of great importance in the maintenance of the reaction of the blood and tissue fluids.

This leads us to the subject of buffers. Mineral salts are also dissociated in watery solutions, and in dilute solutions almost completely. Salts of a strong base and a weakly dissociating acid act as buffers in solution; that is, when acids or alkalis are added to such solutions they prevent the considerable change in hydrogen ion concentration which results when equivalent amounts of the acids and alkalis are added to pure water.

One of the most efficient of these buffer salts is sodium bicarbonate, and this is the most important of the buffer substances in the body fluids.

Supposing an amount of lactic acid be added to a solution of sodium bicarbonate. The following reaction occurs, since lactic acid is a much stronger acid than carbonic acid:

$$HL + NaHCO_3 \rightleftharpoons NaL + H_2CO_3.$$

The lactic acid and sodium bicarbonate are strongly dissociated, so there are many H^+ ions and many HCO_3^- ions. These will combine to H_2CO_3, which dissociates very little; hence the H^+ ion concentration rises to a very small extent.

$$H^+ + HCO_3^- \rightleftharpoons H_2CO_3$$

where the reaction proceeds almost wholly in the direction of undissociated H_2CO_3. The rise is still further depressed by the dissociation of excess $NaHCO_3$. This dissociates into Na^+ and HCO_3^- ions. From the law of mass action

$$\frac{[H^+] \times [HCO_3^-]}{[H_2CO_3]} = K$$

$$\text{or} \quad C_H = [H^+] = \frac{K[H_2CO_3]}{[HCO_3^-]}$$

In the presence of the relatively large amount of sodium bicarbonate in blood practically all the HCO_3^- comes from the bicarbonate, only about 1 in 10,000 coming from the H_2CO_3, since the H_2CO_3 is extremely little dissociated; so in our example above, while there is excess of $NaHCO_3$, there is very little change in the hydrogen ion concentration. Since this is the case, we may represent the above equation as

$$[H^+] = \frac{K[H_2CO_3]}{\alpha[NaHCO_3]}$$

where α represents the degree of dissociation of the $NaHCO_3$. In the small changes which take place in the blood α is practically constant, so we may replace $\frac{K}{\alpha}$ by a new constant, K_1. The equation then becomes

$$C_H = [H^+] = \frac{K_1[H_2CO_3]}{[NaHCO_3]}$$

which means that the hydrogen ion concentration of the blood depends on the ratio $\frac{[H_2CO_3]}{[NaHCO_3]}$, which in the normal blood is about $\frac{1}{20}$. There are other buffer systems in the blood and tissue fluids, but this is quantitatively by far the most important because of the ease with which the body gets rid of CO_2.

It is apparent that there are four ways in which the hydrogen ion concentration of the blood may be altered to produce either an acidosis, that is an excess of hydrogen ions above the normal, or an alkalosis, that is a deficit of hydrogen ions below the normal:

1. Increase in $[H_2CO_3]$ = gaseous acidosis.
2. Decrease in $[H_2CO_3]$ = gaseous alkalosis.
3. Increase in $[NaHCO_3]$ = non-gaseous alkalosis.
4. Decrease in $[NaHCO_3]$ = non-gaseous acidosis.

If $[H_2CO_3]$ and $[NaHCO_3]$ be increased or reduced to an equivalent amount there will be no change in the hydrogen ion concentration.

Gaseous acidosis results from CO_2 retention in the body, from depression of the respiratory centre, from breathing air with excess CO_2, from chronic pulmonary emphysema, or from respiratory tract obstruction insufficient to cause asphyxia. This is usually compensated by the kidneys excreting more acid and so increasing the available $NaHCO_3$ in the blood. If the compensation mechanism breaks down and the acidosis is sufficiently severe, coma will result. Gaseous alkalosis results from CO_2 deficit from the elimination by the lungs of more CO_2 than is being produced in the body. Any condition which leads to hyperpnœa above what is necessary for oxygen requirements will bring this about. If uncompensated and severe, it will cause tetany. Compensation is brought about by elimination of base by the kidney so that the alkali reserve of the body is reduced. It is obvious that the giving of bicarbonate by the mouth in such a case will aggravate the condition.

Non-gaseous alkalosis may result from excessive administration of alkalis, as in gastric ulcer, or excessive loss of hydrochloric acid from the stomach by vomiting. Compensation consists in part in retention of CO_2 in the body, in part in excretion of excess base in the urine. In alkalosis there is an increased formation of lactic acid in the tissues and in the blood itself. This combines with bicarbonate, setting free CO_2 and reducing the amount of $NaHCO_3$, so tending to bring the ratio back to normal. Ketone acids also pass into the blood in alkalosis and have the same effect as lactic acid, so that a ketonuria may be present in alkalosis, as well as in some forms of acidosis.

Non-gaseous acidosis results from the passage into the blood of an acid stronger than H_2CO_3, which combines with the base and sets free CO_2. In severe muscular exercise an acidosis always occurs from the passage of lactic acid from the muscles into the blood. In disturbed carbohydrate metabolism the ketone acids have a like effect. In impaired renal efficiency acid substances may be retained in the body and act similarly.

There are also mixed types of acid base imbalance.

Peters and Van Slyke state:

> Acidosis may be broadly defined as an abnormal condition caused by the accumulation in the body of an excess of acid or the loss from the body of alkali. Alkalosis may be similarly defined as an abnormal condition caused by the accumulation in the body of an excess of alkali or by the loss of acid.

The bicarbonate buffer system plays probably the most important part in controlling the reaction of the blood when fixed acids or bases are added to the blood. The other buffer systems play a greater part in preventing any appreciable change in reaction when CO_2 is added to the blood in the capillaries from the tissues. These are hæmoglobin particularly and, to a less extent, other proteins and phosphate. So efficient are these buffer systems that, when in a person at rest the arterial blood plasma has a pH of 7·42, that of the venous plasma is 7·39.

The mechanisms in the body for controlling the reaction of the blood and tissue fluids are particularly efficient. These include, as well as the buffer system, the action of the kidneys and the lungs. Increased CO_2 in the blood, and in particular in the tissues of the respiratory centre, leads to increased breathing, so that the excess is eliminated in the expired air.

The kidneys can control the amount of acid or base separated from the blood by varying the proportion of acid phosphate and alkaline phosphate. If there is excess of acid ions in the blood, the kidneys excrete much acid phosphate and little or no alkaline phosphate.

Another mechanism is the excretion of organic acids not combined with base when for the reasons stated the urine is very acid.

A third mechanism is the elaboration in the kidneys of ammonia, which is excreted with acid radicles, the base attached to them when they were in the blood being returned to the blood, probably as bicarbonates. In alkalosis the above three mechanisms are reversed, and in addition the kidneys excrete bicarbonate.

The mechanisms fail only when either too much acid or base is being added to the blood for them to deal with, or the lungs or kidneys become inefficient through disease.

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British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Alexandra Hospital for Children, Sydney, on April 23, 1936. The meeting took the form of a series of demonstrations by members of the honorary staff. Part of this report appeared in the issue of May 23, 1936.

Acute Ascending Myelitis (Landry's Paralysis).

DR. C. L. S. MACINTOSH showed a male child, aged twelve years, who had been admitted to hospital on March 26, 1936. There was nothing of note in his previous history, excepting that on March 13 and 14 he had remained in bed on account of headache and dizziness. He attended school as usual next day, remaining apparently normal until March 22. On March 22, 1936, numbness was noticed in the fingers of both hands. At lunch, lack of power was experienced in the right hand, and this prevented efficient use of the knife. An hour and a half later, at a game of cricket, it was noticed that the legs were "heavy" when running, and that bowling "lacked the usual force". At this time the left upper limb appeared normal. In a short time he felt "heavy" all over; he walked with some difficulty, and slowly, and in an attempt at keeping up with others walking the patient had practically to run. At tea on March 22 he could "just hold" the knife. The left hand was of little use. He had to be fed. The arms could be freely swung about. Later the head felt "heavy" and he retired, sleeping well.

On March 23 difficulty was experienced in getting out of bed and he could "just walk" by holding on to articles of furniture. He next attempted to dress. It was impossible to pull the trousers on and he was unable to raise his arms sufficiently to get his shirt on. He returned to bed. Pains were experienced in several joints. At this stage Dr. G. M. Barron was consulted. Towards evening little power remained in the lower limbs.

On March 24 the condition was worse. Joint aches and pains, mainly hip and wrist, had prevented sleep during the previous night. Power in the upper limbs was so diminished that he could only cross the forearms on his chest.

On March 25, 1936, the condition was about the same. He had a sleepless night on account of joint pains. He was admitted to Manly Hospital on this day, and some poliomyelitis antiserum was given.

On March 26, 1936, the condition was worse. The only movements possible were those of the toes and fingers to a slight extent. The cerebro-spinal fluid contained much blood. The patient's breathing was "heavy". He was transferred to the Royal Alexandra Hospital for Children. On admission, he was seen to be a well developed and intelligent lad, although not fat. The breathing was shallow, the colour good, and speech slow. The only voluntary movements possible were neck movements, facial movements, and, to a very limited degree, movements of the shoulder girdle. The tongue was very dirty. There was flaccid paralysis of the upper and lower limbs and of the trunk muscles. Plantar, cremasteric and knee reflexes were absent. The abdominal reflexes were present. Sensation appeared to be normal. The general condition was too poor for lumbar puncture to be attempted.

On March 27, 1936, the general condition was about the same. Respiration was more difficult, and the accessory respiratory muscles were being brought into use. He was troubled with salivation. The shoulder girdle muscles were much weaker. The "spine sign" appeared to be present.

On March 28, 1936, at 6.30 a.m., the condition was rapidly becoming worse; the intercostal muscles had failed and all available accessory muscles of respiration were being drawn upon. The colour was bad and the condition was very serious. At 7 a.m. he was placed in the Drinker apparatus and artificial respiration was commenced, with immediate relief. This was continued until 6.45 p.m., when he was able to breathe alone. At 7.45 p.m. artificial respiration was again necessary; it was continued until 10 p.m., when he was returned to bed. During the day voluntary control of the neck muscles failed and the only movements possible were those of the eyes and facial muscles. The muscles of deglutition began to fail during the night of March 27-28, and during the day all power of swallowing disappeared. On this account salivation was troublesome and a mechanical sucker was necessary. Speech was very slow and almost impossible.

On April 29, 1936, there was a slight improvement; the patient was just able to swallow. Slight movement of the neck was possible. All reflexes were absent. Sensation appeared normal. The breathing was shallow. The patient was comparatively comfortable. Return to the Drinker apparatus became necessary from 7.30 p.m. to 8.30 p.m.

On March 30, 1936, there was a gradual slight improvement.

On March 31, 1936, the patient had slight power of movement of the shoulder girdle muscles. On one occasion on this day he lost control over the bladder. This was the only time when incontinence of urine occurred. He had control over the bowels during the whole period of the illness. Severe epistaxis occurred. The bleeding time was found to be forty seconds and coagulation time four and a half minutes.

From March 31 on there was a gradual and uninterrupted improvement. At the time of the meeting he was able to swing his arms about, turn over in bed, and flex the elbows. There was little movement in the lower limb, toes and fingers. Reflexes were absent in the lower limbs. The abdominal recti reacted. There was still pain and resistance when the spine was flexed.

The temperature reached 37·2° C. (99° F.) during the first three days after admission; thereafter there was no pyrexia. Dr. Macintosh said that it was too early to determine what degree of paralysis would remain, if any.

Anæmia Infantum Pseudoleuchæmia (von Jaksch).

Dr. Macintosh also showed a male patient, aged three years, who had been admitted to hospital on April 7, 1936. There was nothing of note in the family history. For the year prior to the patient's admission it had been observed that he was pale. He had become paler during the past six months. The abdomen had always been big, but had recently increased in size. For the month prior to admission the child had not been well; he had had a cold and had been tired and listless. For the previous week he had had diarrhœa. The motions had been dark; but blood had not been noticed.

Examination revealed a pale, well nourished child, with a large abdomen. The spleen was greatly enlarged, extending into the left iliac fossa and to the right to the umbilicus. The liver was just palpable. The superficial inguinal glands were palpable. Hæmic murmurs were present, best heard towards the pulmonary area. A blood count on April 9, 1936, revealed 2,690,000 red cells per cubic millimetre, a hæmoglobin value of 28%, and colour index 0·54. The red cells were pale; polychromasia was marked; the cells varied greatly in size and shape, smaller cells predominating; microcytes were plentiful; five normoblasts and one megaloblast were seen, as well as a number of reticulocytes. The white cells numbered 9,100 per cubic millimetre, 63% of them being polymorphonuclear cells, 26% lymphocytes, and 11% monocytes. One myelocyte was seen. Blood platelets were large and plentiful. There was no evidence of activity on the part of the bone marrow. On April 15, 1936, there was little alteration in the red cell count; four normoblasts and five megaloblasts were seen. The leucocytes numbered 11,800 per cubic millimetre (polymorphonuclear cells 60%, lymphocytes 34%, monocytes 6%). One myelocyte and one metamyelocyte were seen. Several mononuclear cells had pseudopodia. The pathologist reported that there now appeared to be some marrow activity; the blood picture was not that of a leuchæmia, but rather of that of an overstressed marrow trying to maintain its output against adverse conditions.

On April 17, 1936, the indirect Van den Bergh reaction was positive. In the red cell fragility test hæmolysis commenced at 0·56% concentration, was marked at 0·45%, and was complete at 0·36%. The urine was acid in reaction and contained no albumin or sugar; urobilin was present, but no bile pigment. X ray examination of the long bones revealed no abnormality.

A transfusion of 180 cubic centimetres (six ounces) of paternal blood was given on April 18.

On April 20, 1936, the red cells numbered 3,710,000 per cubic millimetre; the hæmoglobin value was 50% and the colour index 0·74. The majority of the cells were pale; but some were well coloured. There were many microcytes. The shape of the red cells was irregular. Six normoblasts and two megaloblasts were seen. The leucocytes numbered 8,800 per cubic millimetre (polymorphonuclear cells 53%, lymphocytes 43%, monocytes 3%, eosinophile cells 1%). Some white cells had heart-shaped nuclei. The blood platelets numbered 420,000 per cubic millimetre.

There was an improvement in the child's colour after the blood transfusion. The child also became much brighter.

On April 22, 1936, the bleeding time was two and a half minutes and the coagulation time four minutes. The temperature remained practically normal, except for an occasional rise to 37·5° C. (99·4° F.). Splenectomy was being considered.

Cerebro-Spinal Meningitis.

Dr. Macintosh also showed a female infant, aged sixteen weeks, who had been admitted to hospital on April 4, 1936. She was a breast-fed infant and had been quite well until April 1, when a "blotchy" rash was noticed on the legs. This rash soon disappeared, but reappeared a little later. Two days later the neck became stiff and the child refused food and was constipated, but did not vomit. At the time of admission examination revealed a well nourished but sick baby with neck rigidity and the head somewhat retracted. The infant was more or less generally spastic. The knee jerks were active and the plantar reflex was flexor. There was no definite Kernig sign. The respiration was rapid; but no abnormality was detected in the thorax. Mentally, the baby appeared bright and normal and was not drowsy. Lumbar puncture was performed and ten cubic centimetres of turbid fluid under increased pressure were withdrawn. The cerebro-spinal fluid contained 700 milligrammes of chlorides per 100 cubic centimetres; glucose was absent; globulins were markedly increased. Of cells, polymorphonuclear cells predominated. The meningococcus was obtained on culture. Meningococcal antiserum was administered intrathecally in a dose of ten cubic centimetres and intramuscularly in a dose of twenty cubic centimetres. On April 5, 6 and 7, thirty cubic centimetres of antiserum were given intramuscularly. On April 6 blood-stained fluid under increased pressure was withdrawn by lumbar puncture. On April 8, 5·0 cubic centimetres of blood-stained cerebro-spinal fluid were withdrawn. Lumbar puncture was repeated on April 9, 5·0 cubic centimetres of blood-stained fluid being withdrawn; on this occasion the pressure was not increased. Culture again revealed meningococci.

On April 11, 1936, 20 cubic centimetres of straw-coloured fluid under increased pressure were withdrawn. No organisms were cultured. On April 14, 10 cubic centimetres of pale-coloured fluid under increased pressure were with-

drawn. A scanty growth of meningococci was obtained on culture. Lumbar puncture was repeated on April 17 and 20, 10 cubic centimetres and 25 cubic centimetres, respectively, of fluid under increased pressure being obtained.

Since admission the child had been rather spastic; but the spasticity had greatly diminished. The temperature had been irregular, being 40° C. (104° F.) on admission, since when it had varied between 36·7° and 39·2° C. (98° and 102·6° F.). The child took food well. At the time of the meeting she appeared to be well on the way towards recovery.

Congenital Occlusion of the Œsophagus.

DR. W. RAMSAY BEAVIS showed a pathological specimen in which the upper part of the œsophagus ended in a blind sac and the lower part of the œsophagus was attached to the bifurcation of the trachea. The X ray report was as follows:

> Barium suspended in milk was given to the infant and a skiagram made at intervals up to four hours. The œsophagus appears to be represented by a large diverticulum arising from the posterior aspect of the upper end of the trachea, the barium passing by means of the trachea into the lungs. Barium was also observed passing from the trachea below the bifurcation into the stomach, so that some communication exists between the trachea and the stomach.

Organic Foreign Body in the Bronchus.

DR. N. H. MEACLE showed a male child, aged twenty months, who had been admitted to hospital on February 27, 1936, with a history of having swallowed some pieces of corn on February 24, after which he had been discovered choking, coughing and blue. The attack lasted for about five minutes, and after it the child continued to have difficulty in breathing. On February 25 one piece of corn was passed *per rectum*. On examination on February 27 the child looked extremely ill. Respiration was very rapid and there was very little air entry into the right lung. X ray examination suggested pneumonic consolidation of the right upper and middle lobes.

On February 27, 1936, under ether anæsthesia, a five-millimetre bronchoscope, with proximal illumination, was passed into the right main bronchus and a grain of corn was seen. The organic foreign body was incorporated in tissue which was the site of gross inflammatory reaction. An attempt was made to remove the foreign body in one piece; but the husk slipped off and came away in the forceps, leaving the softened grain of corn broken up into several pieces. Several of these pieces were removed by forceps and suction, the first bronchoscopic session lasting about twenty minutes. Within the next twenty-four hours there was a considerable improvement in the general condition of the patient.

On March 2, under ether anæsthesia, bronchoscopy was again carried out and the remaining pieces of corn were removed from the right main and lower lobe bronchi by means of forceps and suction.

On March 11, 1936, the child was discharged from hospital quite well, after a rapid and uninterrupted recovery.

Disorders of Personality.

DR. D. W. H. ARNOTT showed a girl, aged nine years, who had been brought to the psychiatric clinic of the Royal Alexandra Hospital for Children on April 6, 1936. The father said that up till about a month before the child had appeared to be quite normal and that she had been very attractive, good-tempered, easily managed and quite docile, although somewhat backward. She had always been of a hypersensitive nature. During the past month there had been a gradual change in her disposition. She had become much more "highly strung", very disobedient, easily irritated and quickly offended. She did nothing but cry, was always picking her nose and biting her nails, and had lost all appetite. She also slept very badly. For the previous three weeks she had suffered from violent headaches, which occurred generally at night and lasted about ten minutes. During the headache she was absolutely prostrated and had to lie down. There was no history of previous illness. There was some mental deficiency.

A consideration of the family history revealed that the father was "nervous", one brother had asthma, and one sister was supposed to have been deficient in thyreoid but was now well.

At the age of six months the patient had developed a squint in the right eye and the right lid had drooped.

Physical examination revealed bad teeth and internal strabismus of the right eye. The patient was undersized and had a slight Mongolian appearance. She was kept in bed at home for three weeks and was given potassium bromide in a dose of 0·5 gramme (eight grains) three times a day. She gradually improved and was now practically at her normal again.

Dr. Arnott said that this child probably had encephalitis at the age of six months, the outward evidence of which was the double ptosis and internal strabismus of the right eye. This was probably also the cause of her mental deficiency. Her change of personality was due to some severe organic cerebral disturbance, probably epileptic in nature.

Dr. Arnott also showed a girl, aged four years and six months, who had come to the psychiatric clinic of the hospital with a complaint of "nerves", pains in the right knee and right ankle for eight months, and slight headaches. Her mother said that until eight months previously the child had been a loving, easily managed, quiet and apparently normal, though sensitive, child. During the past eight months she had gradually become irritable, restless and unmanageable, and flew into violent rages. She also "fell about" easily. For the past three months she had been scratching her legs a great deal and had been nodding her head. She also laughed stupidly at times. There was nothing of importance in the family history. The child had had no previous illnesses, had developed normally and had a normal intelligence. She had always been hypersensitive and easily upset; but during the past eight months this had been greatly exaggerated. Physically no abnormality could be detected. The child was ordered to bed at home for a week on a diet of milk and fruit and was given "Luminal", in a dose of 0·015 gramme (one-quarter of a grain) twice a day, and cod liver oil. She improved quite rapidly and was gradually returning to her normal self again; but the symptoms tended to recur if she became excited.

Dr. Arnott expressed the opinion that this patient was suffering from a mild encephalitis, probably of a rheumatic nature.

Dr. Arnott's last patient was a boy, aged seven years and eight months. The mother said that the patient had been knocked over by a bicycle twelve months previously, sustaining a broken collar bone but no actual concussion. Before the accident he had been quite a normal boy and had been calm and inclined to be quiet and reserved. Since the accident he had become "dreadful". He was very easily excited, disobedient and bad-tempered if he was opposed. He had become very "highly strung" and fidgety; he shrugged his shoulders, pulled his mouth from the side, nodded his head, brushed his hands up and down his body and had various other tics. He stammered when upset since the accident. Physically no abnormality was detected. He seemed of normal intelligence. He had whooping cough and measles at the age of three.

He was given "Luminal" in a dose of 0·03 gramme (half a grain) twice a day. He gradually improved and at the time of the meeting was practically normal in his disposition. His stammer had also greatly improved and this had been assisted by attendance at the speech-training clinic. There were still a few involuntary movements of the face.

Dr. Arnott said that this child displayed signs of cerebral irritation which would seem to have been due to severe mental shock, but which had rapidly settled down with small doses of "Luminal".

Dr. Arnott went on to say that each of his cases exhibited a change in personality, the result, he thought, of cerebral

irritation, two of the cases being of organic origin and the other of psychic origin. It was important to recognize the signs of cerebral irritation, whether as the result of mild encephalitis, epilepsy, trauma, chronic ill-health or psychic shock, and to prevent its becoming chronic. This could be done by adequate rest in bed, suitable diet and appropriate sedatives.

Skiagrams.

DR. H. R. SEAR demonstrated a series of skiagrams, with diagrams and photographs, of cases of craniostenosis, showing oxycephaly, turricephaly, scaphocephaly, scaphoplagiocephaly, the *Lückenschädel* of Engstler, acrocephalosyndactylism, the *foramina parietalia permagna* (Pamperl), of which several cases had occurred at the Royal Alexandra Hospital for Children and had been described as agenesis or *aplasia cranii*, and *foramina parietalia permagna* in association with oxycephaly. He also showed skiagrams showing the racial features of the inhabitants of Lebanon.

DR. ERIC W. FRECKER displayed a series of X ray films of the lungs illustrating the usefulness of the X ray examination in the common happenings of daily clinical practice amongst children. These included the differing varieties of pneumonia and their various complications. The various forms of effusion-free, encapsulated and interlobar pneumonia were demonstrated, and the particular value of the lateral chest film in such conditions was stressed. The frequency of bronchiectasis as a result of sinus infection was discussed and typical films were displayed. One illustration in particular showed very clearly the basal atelectasis that often resulted from basal bronchiectasis; this was seen on the film as a triangular mottled shadow visible through the heart and lying next the mid-line. The moral was drawn, in view of the frequency of this lesion, that all chest films, in children at least, should be exposed sufficiently to outline the structures behind the heart. This was important, because many radiologists still held that films of children's lungs should be exposed lightly and with as soft a radiation as possible. Dr. Frecker said that such a procedure was responsible for many a wrong interpretation.

A second series of films, exhibited as lantern slides, illustrated the X ray appearance of the epiphyseal areas of bone in various diseases, including rickets, scurvy, syphilis and sundry others. An attempt was made by means of microscopic sections to explain how the pathological changes in the endochondral tissues were depicted on the X ray film, and hence to demonstrate that X ray interpretation was founded on the same principles as pathological diagnosis and was not merely an empirical illusion peculiar to the radiologist.

Pathological Exhibits.

DR. F. TIDSWELL showed a series of specimens illustrating acute lesions of the brain, namely: meningitis (pneumococcal, meningococcal, influenzal, staphylococcal and tuberculous); cerebral abscess; encephalitis; cerebral hæmorrhage and cerebral thrombosis.

Dr. Tidswell also showed preparations of the membrane and respiratory lesions in diphtheria.

Cryptorchidism.

DR. J. STEIGRAD showed five patients who had been treated for cryptorchidism by means of hypodermic injections of "Antuitrin S". Four of the patients had responded satisfactorily. Dr. Steigrad said that the dosage used had been one cubic centimetre a day for seven days, then one cubic centimetre three times a week, though in the more recent cases he had increased the later doses to two cubic centimetres.

The first patient was eleven years of age. On October 10, 1935, his testes were lying high up in the canals. After the administration of 14·5 cubic centimetres of "Antuitrin S" (1,450 rat units) both testes were lying normally in the scrotum.

The second patient, aged nine years, was a mentally retarded boy, with some degree of oxycephaly and nystagmus. Both testes were in the canals. After the administration of four cubic centimetres of "Antuitrin S" (400 rat units) both testes were lying normally in the scrotum.

The third boy, aged six years, had both testes lying high up in the canals when first seen; but after the administration of seven cubic centimetres (700 rat units) of "Antuitrin S" both testes were lying normally in the scrotum.

The fourth boy, aged eight years, had asymmetry of the limbs, scoliosis, hypospadias and double cryptorchidism. The left testis was in the canal; the right could not be felt. This boy was given larger doses of "Antuitrin S" and no change occurred until 20 cubic centimetres (2,000 rat units) had been administered. In all, he was given 55 cubic centimetres and the result at the time of the meeting was that the left testis was lying in the scrotum, but not exactly in its normal site, and the right testis was through the external ring, but lying rather high in the scrotum. Dr. Steigrad intended to continue the treatment.

The last patient, aged ten years, had both testes in an extraabdominal position, but lying high up. There had been no change as a result of the administration of 34·5 cubic centimetres of "Antuitrin S".

Dr. Steigrad pointed out that no ill-effects had occurred in any of the cases, although in each there had been swelling of the testes during the treatment. One patient had complained of some pain.

It was Dr. Steigrad's intention to make a full report of this form of treatment when a larger number of patients had been treated.

A MEETING of the Tasmanian Branch of the British Medical Association was held at the Tasmanian Museum on May 14, 1936, DR. E. BRETTINGHAM MOORE, the President, in the chair.

Gallie's Operation for Inguinal Hernia.

DR. FRANK FAY gave a lecture-demonstration on Gallie's operation for inguinal hernia. He said that the repair of an inguinal hernia was perhaps one of the commonest and simplest of operations, yet most of those present would admit to an occasional failure or recurrence of the condition. Failure was most likely to occur among persons in middle life or later who had begun to lose abdominal tone and whose abdomens were inclined to become pendulous. It was for this class of case that Gallie's operation was particularly suitable. It was also advisable to use it in all persons over forty years of age who had to perform heavy manual work.

Before describing the operation Dr. Fay referred to experimental work on the transplantation of fascial suture. He said that transplantation of tissues from one part of the body to another was now a recognized surgical procedure. Skin grafting was regularly practised. Transplantation of bone had been a splendid addition to the means of promoting union in fractures, although the hopes of investigators that the transplants would continue to live intact had been doomed to disappointment. Transplanted bone died because the bone cells were so remotely placed in their lacunæ that it was impossible for lymph to reach them. Only those cells which lay on the surfaces of the transplant and in the open mouths of the Haversian canals and which had not become enclosed in lacunæ continued to live. In the case of fibrous tissues, however, there was no such arrangement of cells within impermeable walls. They lay irregularly scattered among the fibres and were so accessible that even after transplantation of the tissue they were able to get sufficient nourishment from the bathing lymph to survive the operation. Many investigators had reported that these tissues might be transplanted with the full expectation that they would continue to live, and to live practically unchanged.

Gallie and Le Messurier, of Toronto, had conducted a series of simple experiments on animals which completely

corroborated the findings of these investigators. The animals used were rabbits, and the experiments had consisted of operations in which patches of fascia, tendon and aponeurosis were excised and immediately sewn back in their original positions. The specimens were recovered at intervals ranging from a few days to many weeks.

During the first few weeks the specimens had shown the ordinary phenomena of inflammation. At first the blood vessels in the tissues surrounding the transplants were much engorged and the whole area was covered with plastic exudate. Very soon a thin transparent film developed over the transplant, consisting of capillary blood vessels and fibroblasts. This film rapidly increased in thickness, and, by the end of the third week had developed into a mass of spindle shaped cells and fibres. The blood vessels in this film increased in size at a corresponding rate until they could be seen with the naked eye, running across the line of suture. During this time the transplant remained alive and showed, on microscopic examination, very little change beyond a moderate œdema. Its outline remained distinct, without any evidence of invasion by new blood vessels or connective tissue and without any leucocytic infiltration. The fibres and cells continued to stain well.

After the third week the inflammatory phenomena had gradually subsided. The hyperæmia and œdema slowly disappeared and the film on the surface became as thin and transparent as the layer of areolar tissue on the surface of normal fascia. In specimens recovered as late as a year after the operation there was nothing to indicate that the cells or fibres had been changed in any way or that their physiological value had been influenced by the transplantation.

These experiments had been repeated many times and always gave the same results, with the exception that when thick pieces of tendon were transplanted necrosis sometimes occurred in the deeper portions. This could be prevented by making a number of longitudinal incisions in the transplant through which the lymph might reach the cells in the interior.

Thoroughly convinced that the fibrous tissues were suitable for transplantation and that they could be expected to remain unchanged for long periods of time, Gallie and Le Messurier had turned their attention to the purposes for which transplants might be made, and to the manner in which the operations should be performed to insure the desired results. From time to time reports of successful patch transplantations of *fascia lata* for the repair of anatomical defects had appeared in the medical literature, but so far there had been no investigations of how these successes had been accomplished, and no statement of the rules which ought to be adopted to avoid the possibility of failure. That failures occurred was unfortunately true, and they had been so frequent that the patch transplantation of fascia had never come into very general use.

The failures had been attributed usually to the supposed necrosis and absorption of the grafts. This explanation might in some cases be correct, for it was easy to imagine that if the transplants were placed in such a position that a free supply of lymph was not available, as, for example, in a mass of scar tissue, necrosis and absorption might occur.

The long series of experiments which had ultimately been carried out demonstrated that in almost all cases the graft lived, whether tendon, fascia or aponeurosis. When the line of incision was subjected to very little strain, as in the longitudinal splitting of a tendon or of the *fascia lata*, the wound healed perfectly, and in a few months could not be found either by naked eye or microscopic examination. When the ordinary movements of the animal, however, caused a strain upon the line of incision, very different results were produced. Sometimes, as in longitudinal incisions in the middle line of the abdomen, the scar which formed was only slightly stretched. In others, as in transverse incisions through tendons and aponeuroses, the wound gave way completely and was covered only by the stretched-out areolar membranes which were normally on the surface of these structures.

It had occurred to Gallie and Le Messurier that it might be possible to eliminate the patch transplant altogether and to replace it by living sutures made from *fascia lata*. To test this idea a series of experiments had been performed in which strips of fascia a quarter of an inch wide and about six inches long were removed from the rabbits' backs and, after being threaded on a needle, were used to sew together the edges of the gap left by their removal. The edges were not drawn into apposition, but were left apart, so that the whole strain would come on the suture and not on any scar tissue which might form in the line of union. To test the effect of the operation on the strength of the sutures, they had made a rough estimate, by means of a special machine, of their tensile strength at the time of the operation and again when the specimen was recovered. Gallie and Le Messurier also studied the question of stretching or contraction of the suture by attaching to it at accurately measured intervals two black silk threads to act as markers. The distance between these markers was measured again when the specimens was examined. The specimens were recovered at intervals from a few days to two years after the operation.

The changes which occurred in the fascial sutures agreed accurately with those already described in connexion with patch transplants. A few days after the operation the surrounding tissues were hyperæmic and the whole area was covered with a thin layer of exudate. The suture was distinctly swollen. At the end of a week minute new blood vessels could be seen spreading through the film on the surface of the suture; these increased in size until towards the end of the third week, by which time the film of exudate had been converted into ordinary areolar tissue. As a result of following the needle through the needle holes the suture had been folded longitudinally. It was completely surrounded by the new film of areolar tissue, which sent processes with new blood vessels between the folds. A cross-section made at the end of the third week showed the suture folded loosely together and completely surrounded with areolar tissue, which extended inward among the folds like the stroma of one of the glandular organs. The cells and fibres of the suture itself remained unchanged. During the succeeding weeks the inflammatory reaction subsided and the œdema disappeared. The suture shrank until it appeared like a glistening white tendinous cord. In longitudinal section it looked like normal fascia, and in cross-section it closely resembled tendon. The folds were now so closely pressed together that they could scarcely be recognized, and the processes of areolar tissue which extended among the folds had become so thinned out as to resemble the normal connective tissue stroma of a tendon. Surrounding the whole was an areolar film from which the stroma, with its blood vessels, passed into the cord. Specimens recovered after the lapse of many months appeared to have undergone no further change. No stretching or contracture occurred, and the strength of the suture was approximately the same as at the time of operation.

The effectiveness of strips of fascia as sutures was fully demonstrated by the specimens. It appeared to be necessary only to anchor the suture securely at its two extremities and to make sure of getting a good grip of the edges of the gap in the fascia to hold them permanently in their original position. The superiority of the suture over absorbable material was self-evident, and over linen, silk or silver wire it had the advantage that it had no tendency to cut out or to set up irritation of any kind. Unlike these materials, it healed to the edges of the defect at the points where the needle passed.

The idea of using strips of the fibrous tissue as living sutures appeared to have solved the uncertainty which had attended the use of patch transplants. In the latter the whole success of the operation depended on the character of the healing of the transplant to the tissues to which it was sewn, whereas in the former this doubtful factor was completely removed and the whole test of the

effectiveness of the operation fell on the transplant itself. If this lived and remained unchanged, and experimental evidence seemed to demonstrate that it did, there was no reason why a great variety of anatomical defects should not yield to fibrous tissue transplantation.

For purposes of description, conditions suitable for fibrous tissue transplantation might be grouped as follows: (i) injuries to tendons, (ii) injuries to ligaments, (iii) certain ununited fractures, (iv) paralytic deformities, (v) facial paralysis, (vi) ptosis of viscera, (vii) hernia.

Dr. Fay proposed to refer only to the use of fascial suture in the repair of inguinal hernia.

A few useful points in the technique of using living sutures had been evolved. Much time could be saved by having a second operator to secure and prepare the sutures. A few minutes before they were required the second operator made a long incision on the lateral aspect of the thigh and exposed the *fascia lata*. The fat and areolar tissues were carefully removed with the blade of a scalpel over the whole area from which the sutures were to be taken. A small longitudinal incision was then made through the fascia, and with a pair of blunt-pointed scissors it was ripped to the required length. This would vary from nine to twelve inches, according to the length of the thigh. A second incision in the fascia was made a quarter of an inch lateral to the first, and one end of the suture so prepared was cut free and trimmed to a point. This end of the suture was passed through the eye of a large curved needle and tied securely after being transfixed with fine silk. The needles were very thick and had an eye which was large enough to allow the strip of fascia to enter easily. The terminal end of the suture was then cut free and a fine linen ligature was tied around it to prevent splitting. The suture was then lifted from its bed and was ready for use. In taking the first stitch the needle was passed through a tough portion of the edge of the gap to be closed and then through the terminal end of the suture. In this way a slip-knot was produced, which formed an excellent anchor. Owing to the slippery character of the fascia, it would be found useful to anchor the sutures at every second or third stitch by some form of knot. When the first suture had been used up, a second might be attached to it in the same way as pieces of tennis gut were fastened together, and the sewing continued. The suture was finally ended by splitting its terminal portion into two strands, which were tied together about the suture in a triple knot. This knot should be made secure by transfixing it with a catgut ligature, which would hold its loops in contact until they became firmly healed together.

The wound in the thigh had never given any concern. When not more than four sutures had been removed, the opening in the fascia could be readily closed with catgut, and there did not appear to be sufficient strain upon it in the ordinary movements of the thigh to cause it to open again. In several of Gallie's cases, however, so much fascia was used that the opening could not be closed, and in these cases no attempt at closure was made. In not a single patient of the two hundred or more from whose thighs strips of fascia had been removed had there been any complaint of symptoms or any evidence of resultant disability. The results in Dr. Fay's own limited series of twenty-five cases corroborated this statement.

In regard to a large series of recurrent inguinal herniæ among soldiers, the findings of Gallie and Le Messurier indicated that it was very problematical, whether the structures which were sewn to Poupart's ligament really did stay in this position for any length of time. In every recurrent hernia operated upon the internal oblique muscle had separated from Poupart's ligament throughout its inner half, and in some there was no evidence whatever that it had been sewn to the ligament. In not one instance, despite the fact that the records showed that the conjoined tendon and the sheath of the rectus had been sewn to Poupart's ligament with kangaroo tendon or catgut, did they find these structures together at the time of the second operation.

These findings had produced a doubt as to whether the sewing of the muscles and conjoined tendon to Poupart's ligament with ordinary catgut sutures was ever a factor in preventing recurrence of hernia. Certainly the experiments in which plication of the fascia of the rabbits' backs was performed would indicate that the adhesions of such structures was extremely slight. To investigate the subject further a few experiments had been performed in which muscles were drawn out of their normal positions and sewn side-to-side with other muscles and with tendons and aponeurosis. In a very short time after the absorption of the sutures the muscle had returned to its former position, leaving no indication that an operation had been done. If, before insertion of the sutures, all areolar membranes were removed from the surfaces which were placed in contact, and particularly if these surfaces were scraped and scarified, the amount of adhesion was greater; but if the normal action of the muscle tended to produce definite strain on the line of suture, the scar tissue soon became stretched and the intention of the operation was defeated. These results demonstrated the folly of dragging structures such as the abdominal aponeurosis, the conjoined tendon, and the sheath of the rectus out of their normal positions to suture them to Poupart's ligament in the hope of permanently strengthening the abdominal wall.

The defect in the ordinary Bassini operation for the cure of inguinal hernia had frequently been recognized, and many attempts had been made to improve on this operation by filling the defect in the abdominal wall with muscular or aponeurotic structures which might be able to withstand the strain. Thus the transplantation of a portion of the rectus muscle to Poupart's ligament, the turning down of flaps of the rectus sheath, and the transplantation of patches of *fascia lata* all had had their advocates. These operations all had the defect, however, that they depended for their success on the healing together of fibrous or muscular structures, a factor which, unfortunately, could not be depended upon. None of them, therefore, had ever become recognized as an established method of procedure.

The structures about the inguinal canal were peculiarly suitable for the use of living sutures. No dependence could be placed on a muscle such as the internal oblique, but in the immediate neighbourhood were the abdominal aponeurosis, the conjoined tendon, the sheath of the rectus, and Poupart's ligament, all strong fibrous structures which would give firm anchorage for the suture. With a sufficient number of strips of *fascia lata*, therefore, the weak spot in the abdominal wall could be filled up completely without any disturbance of the normal anatomical relations and without any dependence on the uncertain process of healing.

The operation for inguinal hernia presented no difficulties. The incision was made so as to allow perfect exposure of the spine of the pubes and the insertion of the conjoined tendon and the rectus sheath. After splitting of the external oblique, the upper leaf was reflected until a good view was obtained of the white abdominal aponeurosis. The sac was dealt with in the usual manner. The first suture of *fascia lata*, a quarter of an inch wide, was then anchored securely into the rectus sheath close to its attachment to the pubic bone. The needle was then passed behind the spermatic cord to pierce Poupart's ligament at its insertion into the pubic spine. If possible, it should be made to pick up the periosteum to make its fixation more certain. When the suture was drawn taut, the weakest spot in the abdominal wall, namely, that which lay behind the external abdominal ring, was filled with a tough aponeurotic tissue which effectively prevented any bulging through the ring. The sewing was continued in an outward direction, the internal oblique muscle being drawn to the reflected portion of Poupart's ligament behind the cord until the position of the internal ring was reached. Here the suture was locked and then carried to the outer side of the ring, where a supporting stitch was inserted. In this way the cord, at the point where it disappeared through the abdominal wall, was surrounded by a fibrous ring which would effectively prevent the development of a hernia at this point. By locking each stitch at this stage the possibility of undue constriction

of the cord was prevented. The sewing of the internal oblique muscle to Poupart's ligament in this manner was a detail of the operation which was of very little value in preventing recurrence of the hernia. It was of value, however, in permanently covering the peritoneum with a thick layer of muscle which would prevent the protrusion of peritoneum through the chinks of the next layer of sutures, which was the important layer in the prevention of recurrence. This layer commenced as a continuation of the first, at the outer side of the internal ring. The needle took a solid bite of the abdominal aponeurosis at its point of fusion with the external oblique and was then passed behind the cord to pick up Poupart's ligament. The suture was carried backward and forward across the space, with frequent lock stitches, until the sheath of the rectus was reached, and this also was woven to Poupart's ligament until the whole space was filled with fascia down to the pubic spine. No attempt was made with the second row of sutures to drag the abdominal aponeurosis and the rectus sheath out of their normal positions. No greater tension was exerted on the sutures than was sufficient to make them lie flat. The whole idea of the operation was to fill the weak spot in the abdominal wall with what might be called a filigree of living aponeurosis, and to depend on the strength of this filigree and on its grip on the surrounding tissues for the cure of the hernia. What was done with the external oblique was of relatively little importance. Usually it was too weak to be of any value. In their earlier operations Gallie and Le Messurier closed it down to the external ring with a narrow strip of fascia. This had been found unnecessary and it was now simply sewn together with catgut. The time which was spent in preventing a hernia from getting out of the canal was much better spent in preventing it from getting into the canal.

Dr. Fay's experience of the results of this operation in the twenty-five cases under review had been very satisfactory.

DR. A. W. SHUGG, in thanking Dr. Fay, paid a tribute to the pioneer work of the late Robert Hamilton Russell in this field.

DR. THOMAS GIBLIN referred to practical points in the Gallie operation and to a special instrument with which the fascial strips could be cut and the long external incision eliminated. He emphasized the importance of the removal of all fat and muscle from the fascia before it was used as a suture. Dr. Giblin had used fascial sutures in a weak appendix scar as well as in operation for the cure of inguinal hernia.

DR. E. BRETTINGHAM MOORE, in thanking Dr. Fay on behalf of the members, expressed the opinion that in certain cases the removal and obliteration of the sac were insufficient and supplementary fascial darnings were essential.

NOMINATIONS AND ELECTIONS.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Radcliff, John Rothivell, M.B., 1934 (Univ. Sydney), Royal North Shore Hospital of Sydney, St. Leonards.

Taylor, Helen Margaret, M.B., B.S., 1933 (Univ. Sydney), Whiteabbey, Wentworth Street, Point Piper.

Correspondence.

HISTIDINE TREATMENT OF PEPTIC ULCER.

SIR: *Re* histidine treatment of peptic ulcer. S.P., aged fifty-five, indigestion since twenty-five. In June, 1935, a diagnosis of duodenal ulcer was made by a radiologist. July 10 to 22 were spent in hospital on ulcer diet, with great improvement. On August 16 the patient was feeling comfortable on diet of tripe, chicken, eggs *et cetera*. Histidine treatment was suggested by me with a view to prevention of recurrence and to enable a fuller diet to be taken, and commenced on August 21. After the second daily injection he complained of having been awakened by pain (abdominal) between 2 and 3 a.m. This had not happened for weeks previously. The pain recurred every night while he was having the daily injections, and after the twelfth he refused to continue the treatment. He had eaten a little meat on the first few days of treatment, but abandoned it after the fourth or fifth injection. This patient had a fairly miserable time till November, 1935, when treatment by "Belladonna Neutralon" was instituted. He improved rapidly and now informs me that he keeps comfortable by taking a single teaspoonful dose of "Belladonna Neutralon" at bedtime and an occasional dose of alkaline powder in the day time. He eats meat at one meal per day and has fruit juice (for vitamins) before breakfast.

Yours, etc.,

H. G. LOUGHRAN.

Kyneton,
Victoria,
April 5, 1936.

SHINGLES.

SIR: Dr. Scot Skirving has written a most interesting article in a recent number upon nerve disorders. I relate a case of shingles with unusual distribution.

A.S., farmer, fifty-two, came to me one morning and told me he awoke with burning pain in his hand and with pain shooting up his arm.

There was a circular patch on the ball of the thumb, the size of a sixpence, and of a reddish tint, and apparently just beneath the skin, which was naturally calloused.

The man was in great agony, both in the thumb and along the outer side of the arm to the axilla; there was slight fever. I did not suspect herpes and gave him sedatives and lead lotion.

He was back in twelve hours, unrelieved, and then he presented a characteristic shingles rash from the wrist to the elbow, and one or two small patches on the upper arm; the thenar spot had not changed.

I injected 0·5 cubic centimetre of pituitrin and in less than one minute the pain ceased entirely and the man could bang the ball of his thumb against the wall with no discomfort, although a moment before the least touch caused great distress.

In about twenty-four hours I was called to him, since he was "as bad as ever", and the same treatment succeeded as before. Two days later I was again called to relieve him, and once more a repetition proved effectual. Since there has been no trouble.

I believe the herpes rash on the thumb was much modified by the thick and horny skin; on the arm itself it was typical.

In another case (a man of sixty-five with *paralysis agitans*), in which the outbreak was upon the chin and scalp, the treatment was almost as effective, except that the pain was entirely relieved, but not the tenderness; he needed but two doses. As before, the effects were almost instantaneous.

Yours, etc.,

H. LISTER.

Cobargo,
New South Wales,
May 21, 1936.

Books Received.

CLINICAL MISCELLANY: THE MARY IMOGENE BASSETT HOSPITAL, by various authors; Volume II; 1935. Springfield: Charles C. Thomas; London: Baillière, Tindall and Cox. Medium 8vo, pp. 237, with illustrations. Price: 13s. 6d. net.

HYDROTHERAPY AND CLIMATOTHERAPY, by Matthew B. Ray, D.S.O., M.D., M.R.C.P., with a foreword by The Right Honourable the Lord Horder, K.C.V.O., M.D., F.R.C.P.; 1936. London: Edward Arnold and Company. Demy 8vo, pp. 319. Price: 12s. 6d. net.

Diary for the Month.

JUNE 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 2.—Tasmanian Branch, B.M.A.: Council.
JUNE 3.—Western Australian Branch, B.M.A.: Council.
JUNE 3.—Victorian Branch, B.M.A.: Branch.
JUNE 4.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 4.—South Australian Branch, B.M.A.: Council.
JUNE 5.—Queensland Branch, B.M.A.: Branch.
JUNE 9.—Tasmanian Branch, B.M.A.: Branch.
JUNE 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 12.—Queensland Branch, B.M.A.: Council.
JUNE 16.—Tasmanian Branch, B.M.A.: Council.
JUNE 16.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 17.—Western Australian Branch, B.M.A.: Branch.
JUNE 18.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 24.—Victorian Branch, B.M.A.: Council.
JUNE 25.—South Australian Branch, B.M.A.: Branch.
JUNE 25.—New South Wales Branch, B.M.A.: Branch.
JUNE 26.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. A. C. McEachern has been appointed Honorary Assistant Pathologist at the Adelaide Hospital, South Australia.

* * *

Dr. R. Segal has been appointed Junior Medical Officer, Office of the Director-General of Public Health, New South Wales.

* * *

Dr. M. McKenna has been appointed, pursuant to the provisions of the *Workers' Compensation Act*, 1928, Certifying Medical Practitioner at Brunswick, Victoria.

* * *

Dr. C. E. Percy has been appointed Acting Government Medical Officer, Office of the Director-General of Public Health, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xx, xxi, xxii.

BLAIR ATHOL DISTRICT HOSPITAL, BLAIR ATHOL, QUEENSLAND: Medical Officer.
DEPARTMENT OF PUBLIC HEALTH, CANBERRA, FEDERAL CAPITAL TERRITORY: Medical Officer.
DEPARTMENT OF PUBLIC HEALTH, WESTERN AUSTRALIA: Medical Officer.
FREMANTLE HOSPITAL, FREMANTLE, WESTERN AUSTRALIA: Junior Resident Medical Officer.
HOBART GENERAL HOSPITAL, HOBART, TASMANIA: Surgeon-Superintendent.
INNISFAIL HOSPITAL BOARD, INNISFAIL, QUEENSLAND: Assistant Medical Officer.
MOOROOPNA HOSPITAL, MOOROOPNA, VICTORIA: Junior Resident Medical Officer.
ROYAL ALEXANDRA HOSPITAL FOR CHILDREN, SYDNEY, NEW SOUTH WALES: Junior Resident Pathologist.
ROYAL NORTH SHORE HOSPITAL OF SYDNEY, NEW SOUTH WALES: Honorary Physicist.
SAINT VINCENT'S HOSPITAL, MELBOURNE, VICTORIA: Honorary Officers.
SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.
THE RACHEL FORSTER HOSPITAL FOR WOMEN AND CHILDREN, SYDNEY, NEW SOUTH WALES: Honorary Officers, Medical Registrar.
WELLINGTON HOSPITAL BOARD, WELLINGTON, NEW ZEALAND: Assistant Superintendent.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

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